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THE

# BOOK OF COMMERCE

BY

## SEA AND LAND,

EXHIBITING ITS CONNECTION WITH

AGRICULTURE, THE ARTS, AND MANUFACTURES.



TO WHICH ARE APPENDED

A HISTORY OF COMMERCE,  
AND A CHRONOLOGICAL TABLE.

PHILADELPHIA:

URIAH HUNT & SON, 44 N. FOURTH STREET,

AND FOR SALE BY BOOKSELLERS GENERALLY THROUGHOUT THE UNITED STATES.

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## PREFACE.

THERE are few words of more extensive signification than the word COMMERCE. If a person will visit a large seaport, crowded with vessels from all parts of the earth, and consider the multitude of articles which they transport across the ocean, he may form some vague idea, not only of the immense value, but also of the infinite variety of the merchandise, which it is the business of Commerce to distribute throughout the world.

But to form a more definite conception of the subject, let a person pass through one of the streets in Boston, New York, or Philadelphia, devoted to the retail trade. Enter for instance a single shop, devoted to one class of goods;—how great is the variety! If the goods are groceries, there are sugars from Louisiana, and the West Indies, teas from China, figs from Smyrna, oranges and lemons from Portugal, wines from France, pepper and spices from the islands of the Pacific, and a multitude of other things, some from one hemisphere, and some from the other; some from climes where the summer never ceases to shed its prolific influences, and some from regions of snow and frost, where winter ‘holds perpetual sway:’ some are sent to us by nations or tribes, who have carried the arts to the highest pitch of perfection, while others are supplied by half civilized men, or perhaps by wandering savages.

How many and how interesting then, are the topics which are suggested by a history of the articles in a grocer's shop? If we proceed further, the subject only expands, and grows more varied and more curious.

This little book is devoted to a description of the leading articles of commerce; including an account of their mode of cultivation, preparation, or manufacture; where they are found; where and to what extent they are exported, &c. It embraces a description of some of the most interesting productions of the animal, mineral, and vegetable kingdom, with a view of the uses to which man has turned them, and the arts by which they are thus converted to the purposes of want or luxury. From the foregoing suggestions, the reader will see that the subject is of great extent and importance, and we trust that from the manner it is treated in the following pages, it may prove both instructive and entertaining to the youthful reader.

It is of course impossible, in a volume of a size adapted to youthful reading, to give extensive accounts of a great variety of articles. We have chosen a medium, and sought to combine a good degree of particularity, with a full list of subjects. If some descriptions are thought brief, the reader will consider them only as hints, to excite curiosity, and lead to further investigation.

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# BOOK OF COMMERCE.

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## CHAPTER I.

### IMPORTANCE OF COMMERCE.—ARTICLES OF FOOD.

1. I am sure that my young readers cannot fail to be interested in an account of that extensive branch of human industry, which is one of the chief sources of the comforts which they enjoy. It is by our intercourse with neighboring and foreign places, that most of the common necessities of life are now obtained. It has been said, that the supper of the poorest artisan has cost the labor of many hundred hands. If we think of nothing but the tea and the sugar, this may be fairly asserted. For consider the toil of those who prepare these articles, the merchants by whom they are shipped, the sailors who must help to bring them to our shores, not to speak of the carpenters, blacksmiths, and other people who must first build the vessel,—and you will perceive the truth of the remark.

2. But commerce does not contribute to our bodily wants and comforts alone. It has an immense influence upon the civilisation and mental improvement of a people. By its aid, the seeds of religion and knowledge are scattered over the globe; the cause of science is strengthened and advanced; and the researches and discoveries of great men of every nation are brought together for the general benefit and good of mankind.

*Questions.* 1. What is said of the importance of commerce? 2. Its effects upon civilisation? 3. Where is wheat thought to have been origin-

#### WHEAT.

3. This important article, from which our daily bread is prepared, may naturally claim our attention first. Africa is thought to be the native place of wheat; but it will grow in almost any climate. In Europe, the grand supply, in times of scarcity, is from Poland; and the principal port for this trade is Dantzic, near the mouth of the Vistula, in the Baltic. Many of the Polish nobles have vast territorial domains, on which grain is grown in such abundance that they cannot use half of it; yet they take no measures to dispose of this superfluity. If the English suspect a want of it, they send to Dantzic, where vast magazines are kept constantly full of wheat; or they travel up the country, and bargain for so much as they find, to be sent to Dantzic. But if no one comes to buy, the wheat is scattered about and lost:

4. Much wheat is sent to Europe and other countries from North America; but it is generally exported in the form of flour. The soil of the United States is well adapted to the growing of wheat; and the states of Delaware, Maryland, New York and Pennsylvania produce it in very great quantities. The cultivation of it gives employment to numerous individu-

ally produced? What country of Europe affords the grand supply? 4. What is said of the exportation of wheat from this country? What

als; and thousands of acres are covered by its growth.



5. Sicily was long the granary of the Grecian states, and afterwards of the Romans. When the Romans had conquered Egypt, the prolific soil of that country supplied them. Any hinderance in these supplies created a famine at Rome; and a sedition among the populace was the usual consequence.

6. The ancients fabled that the goddess Ceres first taught men to sow grain. She came from Sicily. Wheat is said to be her daughter; and as that lies so many months buried in the earth, the poets imagined that Pluto, god of the infernal regions, ran away with her; though at last he agreed to let her continue above ground all the summer months. The name of this daughter of Ceres was Proserpine.

#### FLOUR.

7. Flour is the meal of wheat finely ground and sifted. It is exported in barrels from many parts of the United States; and is one of the staple commodities of the country. Some of the principal flour mills are those of Brandywine in Delaware and of Rochester in New York; these are the most extensive, but there are large flour mills in most of the southern states. Many of these mills are so con-

states produce it in the largest quantities? 5. What is said of Sicily? 6. The fable of the an-

trived that the wheat is carried by machinery to one of the upper rooms and there ground; it then falls into a room below and is sifted or bolted, and falling still lower is received into the barrels, and there packed and headed ready for shipping, and the whole process, which formerly occupied a considerable time, is now by the aid of new machinery, reduced to the work of a few minutes.

#### MAIZE.

8. Indian corn, or maize, is a native production of North America, and till visited by the Europeans it was the main dependence of the Indians for food. They were accustomed to boil it, and eat it when soft. They have now learned to make bread of it. Immense quantities of this corn are raised in Ohio and other of the western states. Like flour it is ground, and vast quantities of it are shipped as corn meal from the southern to the northern states. Corn meal is not however so great an article of commerce as flour, as it is more liable to be affected by heat, and rendered sour and unfit for use.

#### BARLEY.

9. This well known species of grain is raised in great quantities, both in North America and Europe. It is the principal ingredient of beer and ale; and all sorts of malt liquor are extracted from it. It is also tolerably good for making bread, particularly if mixed with the meal of some other grain. More than thirty million bushels of barley are annually converted into malt in Great Britain.

#### RICE.

10. Rice is a plant very much resembling wheat in shape, color, and the figure of its leaves. The stem does not much exceed three feet in height. Rice for the most part requires a low and moist soil

cients? 7. What is flour? What are some of the principal flour-mills in the United States?



but there is a sort grown on the higher lands, which is in great esteem.

11. In China the rice crop is of great importance; it forms the principal part of the food of the inhabitants; and, as much of the land lies flat and low and the country is plentifully intersected by canals, it has an excellent opportunity for irrigation. From the time the seed is sown, till it is almost ripe, it requires the fields to be covered with one entire sheet of water.

12. The rivers of China annually overflow these low grounds, bringing with them a rich manure of mud; and when the mud has lain a few days, the Chinese prepare to plant the rice. They enclose a piece of ground with a clay-bank; they plough up the soil, and harrow it, with the help of buffaloes. The grain is sprinkled rather thickly over the field, and immediately a sheet of water is let in, which covers the whole to the depth of a few inches. Channels are cut from the rivers and canals to effect this. Where the grounds lie too high for the rivers to overflow them, water is raised by pumps and other hydraulic machines, for this purpose. Sometimes, a chain of pumps is constructed, each one raising the water a little, till the proper height is gained. This is, however, only a preparatory seed-bed.

13. The ground is next prepared for the main crop, by ploughing, harrowing, and laying it level. As soon as the plants in the seed-plot are about seven inches high, they are plucked up by the roots, and planted separately, in rows, either in furrows, or in holes about six inches asunder. Water is again brought over the whole field, which is divided by low clay-banks into smaller plots, to which the water is conveyed by channels, at pleasure. As the rice grows and ripens the water

dries away. So that the crop when ripe, covers dry ground. The rice is reaped with a small toothed sickle.

14. Neither carts nor cattle are used to carry away the crop; the sheaves are laid upon frames, which are carried, one hanging at each end of a pole or bamboo, on a man's shoulder. Sometimes these sheaves are threshed out with a flail; sometimes the ends are beaten against a board set up on its edge, or against the sides of a tub; or, more frequently, the sheaves are laid on the ground, in a circle, and oxen are driven over them, to tread out the grain.

15. The grain is separated from the husk, frequently by pounding in a sort of mortar. A heavy stone fastened to a lever is raised, by a man treading on the other end. In some cases, mills are built, which lift up these levers, perhaps twenty at a time. Sometimes the rice is ground between two flat stones, kept so far asunder as not to crack the grain itself. As the first crop ripens in May, the ground is immediately prepared for a second, which is reaped about October.

16. Half the people of Asia live upon rice. It is almost the only food in many parts of Africa, especially among the Moors, in the northern provinces. Great quantities are also carried to Europe, where it is in high esteem. In some countries, fowls and meat are stewed with the rice, and served up altogether.

17. In 1697, rice was carried to South Carolina, where the soil and temperature have suited it so well, that it has become a great addition to the products of that state. The grain grown there is larger than that which comes from the East Indies; which, added to its swelling and softening more, in the cooking, makes it in higher repute.

8. What is said of maize? 9. Barley? 10. Rice?  
11. What is said of the rice-crop in China? 12.  
13. How do the Chinese cultivate their rice?

14. What is done with the sheaves? 15. How is  
the grain separated from the husk? 16. Is rice  
much an article of food? 17. When was rice

18. The lands which produce rice are more numerous and more fertile in the southern parts of North America, than in any other part of the world. Along the whole coast from the bay of Delaware to the Gulf of Mexico, there is almost one continued tract of rice-fields. The rice-fields, or marshes of Virginia alone produce more rice than is sufficient to supply all the people of America.

19. There is also in the inland parts of North America, a description of wild rice, which has been found of great use to the new settlers, as affording them a supply, till their lands could be made productive. It grows in places where the water is about two feet deep. The Indians gather it thus: about the time that it begins to ripen from its milky state, they go into the



midst of it in their canoes. They tie together large bunches of it, just below the ears, or panicles; in about a month it becomes quite ripe, and hard. Then, near the end of September, they return, and running their canoes under these several bunches, they beat the grain out, and catch it as it falls. They then dry it in smoke, and rub or tread off the husk.

20. Besides the places already mentioned, the common rice thrives well in Spain, Italy and other parts of Europe.

carried to South Carolina? 18. Is rice successfully raised in this country? 19. What is said of wild rice? 20. In what other countries does

## SAGO.

21. Sago is the pith of a tree, which grows in the East Indies, chiefly in the Spice Islands, and is a species of palm. The fruit of the tree is worth nothing as food; the only eatable part being the pith, which fills the inner part of it. The bark is about an inch thick, and covers an assemblage of long fibres, interwoven with each other into a kind of net work, which is enclosed and every where mingled with a gummy powdery substance, almost like meal.

22. The natives are obliged to destroy the tree to get at this substance, which is very important to them as a substitute for bread; besides being an article of exportation, as they send vast quantities of it to Europe. The tree grows to be thirty or forty feet high, and its diameter is often two feet. This large tree is cut down and sawed into pieces, each about five or six feet long; and these are split, that they may more easily strip off the bark, and get at the mealy pith. This substance they scrape out carefully, and soak, and wash it in water, to get it quite clear from any fibrous or woody matter that may adhere to it. They then pound it in mortars, and strain it through bags and cloths, as the meal will run through with the water, and leave the refuse behind, which is thrown away. The meal thus becomes a kind of paste, which may be eaten directly, or preserved for several years. When they want to use it, they dilute it with water, or bake or boil it, as they please.

23. That which is exported is first dried, and hardened, in earthenware dishes, by means of fire. It is then a sort of bread, and will keep a great length of time, and in any climate. Sometimes they eat this sago bread just warm as it is baked, when

rice thrive? 21. What is sago? 22. How is it obtained? Describe the tree which produces it. 23. How is sago prepared for exportation?



it resembles our hot rolls. Should they make the fire too fierce, the ends and corners would be done too much, and become a sort of jelly.

24. It comes to us in small grains, somewhat resembling coriander seed. To bring it to this state, they moisten it, and then rub it through a sieve, into an iron pan, under which is a fire; which partly hardens each drop as it falls; thus the separate grains are half baked; in which state it will keep a long while, if well defended from the air; otherwise it is liable to become sour.

25. Three or four hundred weight of sago are often obtained from a single tree. There is a species of sago brought from the West Indies, but it is inferior to that brought from the East.

#### PEAS AND BEANS.

26. The common peas when dried are in considerable demand as food for cattle and hogs. There is a better sort, which is in use for the table. Beans are extensively raised in New England. They form a great article of food among the people, and a ship's stores would be incomplete without them.

#### BEEF AND PORK.

27. Considerable quantities of these articles are salted and packed in barrels and half barrels in the northern and middle states for home consumption, ship stores and for exportation to the West Indies and other places. Pork is extensively sent from Ohio to New Orleans. Lard forms a considerable article of commerce between the western, southern and eastern states, and the West Indies. There is a mode of preparing beef practised in South America, for preservation, by curing and drying. When so prepared it is

called jerked beef, and forms an important article for exportation.

#### CHEESE AND BUTTER.

28. Good cheeses are made in New England, and other parts of the United States, and exported to the West Indies. The cheeses of Holland are held in the highest esteem, and come to us usually in the form of a pine-apple. The English cheese, called Cheshire, acquires its peculiar flavor chiefly from the marshes where the cows which yield the milk feed. Butter is an article of very general domestic produce, and is exported from the United States in tubs or firkins to the West Indies, South America and other places.

### CHAP. II.

#### ARTICLES OF FOOD.—CONTINUED.

#### COD-FISH.

1. The general resort of the cod-fish is on the banks of Newfoundland, and the other sand-banks that lie off the coasts of Cape Breton, Nova Scotia and New England. The grand sand-bank on which the cod-fish are taken is represented as a vast submarine mountain, of more than five hundred miles in length, and nearly three hundred miles broad. Seamen know when they approach it, by the great swell of the sea, and the thick mists that impend over it.

2. The labor of catching the cod-fish is very great, as they are caught singly with the hook; yet an active fisher may catch three hundred, or more, in a day; and his comfort is, they will not bite at night. The weight of these fish, which are often three feet long, and the great coldness of the climate, render the work very fatiguing. Six or seven hundred vessels

24. How does it come to us? 25. What quantity may be obtained from a single tree? Where is it brought from? 27. Are beef and pork articles of commerce? What of lard? 28. Cheese and butter?

1. Where do the cod-fish generally resort? What is said of the Grand Bank? 2. What of catching cod-fish? How many vessels may be seen engaged at a time in the business? 3. What is done with the fish when caught? When is the

may be seen at a time engaged in this profitable work; in size, from a hundred to a hundred and fifty tons. As they generally succeed in taking thirty or forty thousand fish each, the whole number taken is immense; though this varies at different seasons, for the fish often change their haunts.

3. As the fish are taken, it is generally the master's business to open them, cut off the heads, and salt the carcasses. This is done as soon as the fish is caught; and the success of the concern depends on his skill and care in these particulars. They are then stowed in the hold to drain; after which they are stripped, salted, and drained again. The best season for fishing is from the earlier part of February to the end of April; as at that time the cod, which had retired to the deeper parts of the sea, return to these shallow banks, and grow large and fat very fast. Such as are caught later are good, but will not keep so long, especially if caught in the warmer month.

4. When several vessels arrive to fish together, he who first touches ground becomes a sort of admiral, and takes his choice of station, and of the wood to be



cut on the island. They each raise a tent on shore, with large scaffolding of fir-

trees, covered with their sails; for they unrig their vessels, and leave nothing but the masts and shrouds standing during their operations of fishing.

5. When the cod are to be dried, they bring on shore every day what they have caught, each crew to their own tent. There they are salted, and dried in the sun, being laid out on stages, and turned several times a day. They are next laid in heaps, and salted again, till properly prepared. They are finally stowed on board ship, and carried to the several markets.

#### SHAD.

6. The shad of America is a very superior fish, and is abundant in the northern rivers. Those of the middle states are much esteemed, and when salted and barrelled command a good price. These fish



are chiefly taken during the months of April and May.

#### SALMON.

7. The salmon, though a salt-water fish, swims up our rivers to spawn. They are caught on their return in great numbers. The rivers of Maine are plentifully supplied with this fish, which the first of the season bring a high price in the great cities, where they are transported, having been packed in ice for preservation. This

nest season for fishing? 4. What is the practice when several vessels arrive to fish together? 5. What is done when the cod are to be dried?

6. What is said of the shad? When are these fish generally taken? 7. What of the salmon? Mention the different methods of taking this fish



## ALMONDS.

7. The tree which produces almonds nearly resembles the peach both in leaves and blossoms. It grows spontaneously only in warm countries, as Spain, and particularly Barbary. The almond harvest in the island of Majorca, is a very merry season. Almonds are of two kinds, sweet and bitter; the Jordan almond is of the highest quality, and the bitter almonds are mostly from Barbary. The best almonds are exported from Malaga. In medicine, the oil drawn from almonds is found useful; and that extracted from the bitter one, if dropped into the ear, proves efficacious in cases of deafness.

## FIGS.

8. Figs are much cultivated in the Archipelago, where they serve almost as bread to the inhabitants. The best are those which come from Turkey packed in cases or drums. While fresh they are excellent eating; and like grapes, they are dried sometimes in the sun, and sometimes by fire. They are covered with the candy of their own sweetness, and are full of a delicious seedy pulp. Figs of a good quality grow in the southern states.

## PRUNES.

9. Prunes were once plums. Some very rich ones, neatly done up in little baskets, are called French plums. The prunes have been dried in an oven. They come to us chiefly from Bourdeaux.

## ORANGES.

10. Oranges are thought to have been originally brought from China. They were introduced into Portugal many years ago; and it is said that the very tree first planted there is still alive; and it is that from which all the orange-trees of Europe have been produced. A great many oranges are brought from Seville in Spain, and the

of the almond tree? What kinds of almonds are there? Whence do the best almonds come? Is the oil of any use? 8. What is said of figs, and hence are the best figs brought? 9. What of

Island of Malta, situated in the Mediterranean furnishes an abundance. Oranges



come to great perfection in the West Indies, and those of the Bermudas are of an extraordinary size. Oranges are sometimes raised in green-houses with success; and they thrive tolerably well in the southern states, but do not form an article of extensive exportation from thence.

## LEMONS.

11. The ports of Lisbon and Malaga are the principal shipping-places of lemons; and they come packed in cases and boxes. They are always shipped while green; and generally become quite yellow before they reach this country. The lemons of the Bermudas are large and of fine flavor.

## CITRONS.

12. The citron is a sort of lemon, but larger, finer, and more fragrant. They

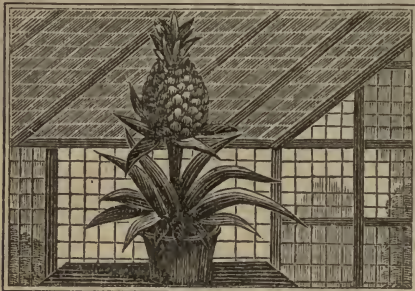


prunes? 10. From what country are oranges thought to have been originally brought? What countries export them principally? 11. From what ports are lemons exported? How are they

are brought preserved from Madeira. They grow likewise to great perfection in many parts of Italy.

#### PINE APPLE.

13. This fruit grows wild in Mexico, South America, Africa, and the East and West Indies. Hot-houses, and great care, will ripen them in the north. The plant itself is very stately, rising from a tuft of



long green leaves, with a stout stalk; the fruit resembles in shape the cone of the pine-tree, whence it has derived its name. It is of a fine yellow color, and has a coronet of green leaves adorning the top.

#### OLIVES.

14. The *olea* or olive-tree is a native of the southern parts of Europe, and is extensively cultivated in France, Italy, Portugal and Spain. Olives have a bitter taste, but pickled they prove more palatable. A sweet oil is obtained from them when pressed, which is in very general use. What comes freely, with slight pressure, is the finest and sweetest; more pressure with some heat, forces out a second sort, not so pure; and a third, still more coarse, is obtained by the aid of hot water and still greater force. Scarcely any vegetable produce is more used than oil; especially in those countries where the climate is too warm for butter.

shipped? 12. What of citrons? 13. In what countries does the pine apple grow? What is said of the plant? 14. What of the olive? How is sweet oil obtained? 15. What are tamarinds?

#### TAMARINDS.

15. These are the fruit of an Indian tree, which grows very large, somewhat like the ash-tree. The fruit grows in clusters, like a number of bean-pods tied together about as long, and rather thicker, each containing several stony seeds enclosed in a dark-colored pulp. Tamarinds are of a cooling nature, and in sickness, help to allay the feverish thirst of the patient. The East India tamarinds are longer than the West India; the former containing six or seven seeds each, the latter rarely above three or four.

#### DATES.

16. Dates are the fruit of a species of palm-tree, which grows in Barbary and other parts of Africa, and in Arabia. They are of a sweetish taste and contain a kernel with a furrow running its whole length. The fruit is frequently imported into this country.

#### COCOA-NUTS.

17. The cocoa-nut is the produce of a tree, which is common in the West Indies, Asia, the South Sea Islands, &c. It is a woody fruit of an oval shape from four to eight inches in length, covered with a fibrous husk, and containing a white, firm and fleshy kernel. The tree is a kind of palm; and the nuts hang from the summit in clusters of a dozen or more together.

#### FILBERTS, WALNUTS, &c.

18. Among the other species of shelled fruit which form a commercial commodity amongst us, are the common filberts, walnuts and chestnuts of this part of the country, the ground-nuts of the southern states, the pistachia-nuts of Sicily and other warm climates, the castana-nut of Louisiana and the West Indies, and many others, which it is perhaps unnecessary to enumerate.

How does the fruit grow? Are the East India longer than the W. India tamarinds? 16. Where do dates come from? 17. What of cocoa-nuts? 18. What other nuts form with us articles of trade?



## CHAP. IV

## ARTICLES OF FOOD.—CONTINUED.

## SUGAR.

1. Whether the sugar-cane is indigenous to the West Indies has been a matter of some dispute, although authors generally agree that it is found growing wild in both continents of America. Yet it seems an allowed fact, also, that, at a very early period of the occupation of Hispaniola, by the Spaniards, Ovando, the governor, procured from the Canary Islands some plants of the sugar-cane; as a curiosity, perhaps as a nicety. But the mode of procuring sugar from it, which occasions its present value and importance, does not appear to have been known, even if the plant were common then. It is to the Spaniards and Portuguese that we are indebted for this process. The plant itself is eatable in some states, and much sweet juice might be extracted from it, in which form only it was used for ages, for the art of granulating and crystallizing that juice had not been discovered.

2. That the sugar-cane grows naturally in the East Indies is well known, and much sugar is now made there, though it is not so strong in its sweetness as that of the West Indies. Marco Paulo, a Venetian, who travelled into the East about the year 1250, tells us, he found sugar plentiful in the Indies: and when De Gama, by doubling the Cape of Good Hope, in 1497, came to Calicut, he not only found sugar, but also, that it constituted a considerable article of commerce among the natives.

3. Sugar was first known to Europeans during Alexander's expedition to India. It was found there by Nearchus, his famous naval commander, above three hundred

years before the Christian era. Possibly we do not err in carrying our researches back to the time of the Jews; for Jeremiah says, chap. v. v. 20, 'to what purpose cometh there to me the sweet cane, from a far country?' Isaiah prophesies, chap. xxxv. v. 7, 'that in the wilderness inhabited by dragons, should grow grass, with the sweet cane.' And indeed Moses, Exod. xxx. v. 23, is told to compound the sacred ointment with (among other articles) 'the sweet cane.'

4. The plant, therefore, has long been known, although the method of extracting sugar from it is comparatively modern. The Romans had nothing in common use as a sweetener but honey; their sweet wines, therefore, must have been very luscious and clammy.

5. The sugar-cane seems to have been more especially brought into the notice of European countries, by the Crusaders. The plant was spread early, by their means, over the lands bordering upon the Mediterranean, Rhodes, Malta, and Sicily, especially; and so, from thence, to Spain, and its newly discovered islands, the Madeiras and Canaries.

6. In the West Indies, the plant appears in all its beauty and usefulness. It is a reed, full of joints, rising to the height of three, six, and sometimes twelve feet, according as the soil is favorable. The joints are from forty to sixty in number. Several stalks rise from one root. The bark, when ripe, is of a golden yellow, sometimes beautifully streaked with red. From the centre, shoots up a sort of silver wand, of three or more feet in length, from the top of which spreads out a kind of plume of white feathers, a little fringed with lilac, or light purple; this is the blossom; so that a

1. What is said of the sugar-cane? To whom are we indebted for the method of procuring sugar? 2. Does the sugar-cane grow naturally in the East Indies? Was sugar found plentifully there by the early travellers? 3. When was

sugar first known to Europeans? Is there any thing, which might be construed into an allusion to it, in Scripture? 4. What did the Romans use for sweetening? 5. How was the sugar-cane brought into notice? 6. Describe the plant, as

field of sugar-canes, when fully grown, is beautiful, and even splendid, under the illumination of a tropical sun.

7. When a plantation is to be made, the ground is accurately marked out, by a line, into little squares of three or four feet wide. A hole, or trench, is then digged in the middle of each square, and the new plants (which are the top shoots of such old ones as have yielded their sugar,) are laid in pairs, horizontally, in them, and covered up about two inches deep in mould. Each of these shoots has five or six joints; every joint will grow and send forth several stems, which appear in about a fortnight.



The labor then is to keep the whole plantation clear from weeds.

8. Not that the plantation is altogether safe, for rats devour, and insects infest the young plants; but the most important marauders, are the monkeys; these come down in troops, silently, during the night; and they are cunning enough to place sentinels around the scene of their depredations, to give alarm in case any interruption should be threatened. While all is safe, they play their antic gambols, by running, scampering, climbing, quarrelling, fighting, and do more mischief thus than by their voracity, although it may be supposed, that such numbers devour a great quantity.

The only way to defend the crop, is to set a numerous watch of negroes, with guns, a work they readily undertake, because they are very fond of monkey's flesh for food.

9. In November, the canes are in blossom; their ripening season comes in the next spring and summer; as different plantations become ripe at various times, and different modes of reaping are adopted.

10. The time of the sugar crop, like that of the vintage, is a season of rejoicing and jollity. The juice of the sugar-cane is so gratifying, so nourishing, so healthful, that all ranks reckon upon it. The sickly negroes soon get well; and the healthy become robust and vigorous. The horses, oxen, and mules, to whom the green tops are given, with skimmings from the boilers, thrive and grow fat, notwithstanding their additional labor; while poultry and pigs fatten on the mere refuse.

11. When the canes are ripe, they are cut down; the leaves and top branches are stripped off immediately, and the stems are bundled up like fagots, and carted to the mill-house; where, by great pressure, the juice is squeezed out, and it runs by a trough into a vessel placed to receive it. To fit them for the mill, they are cut into pieces about three feet long. The mill consists of three upright rollers; the canes are drawn through between the middle and one of the other rollers, and then returned to be compressed again between the middle one and the other; by which they become quite dry, and are only fit for fuel to boil the liquor.

12. The juice thus obtained would ferment presently, if it were not boiled. This part of the process, therefore, takes place directly. Some powdered lime is mingled with the juice, to imbibe an acid

it appears in the West Indies. 7. A plantation. 8 To what enemies are the plantations liable?

9. When do the canes blossom and ripen? 10. How is the time of the sugar crop observed?



which abounds in it. The heat is applied, and increased gradually, that the scum may rise; were it to boil furiously, the dregs would mingle, so that it never could be purified. The juice thus clarified is boiled again and again; which repeated boilings not only cleanse it from more scum, but also evaporate the watery particles, so that what remains is more ready to crystallize.

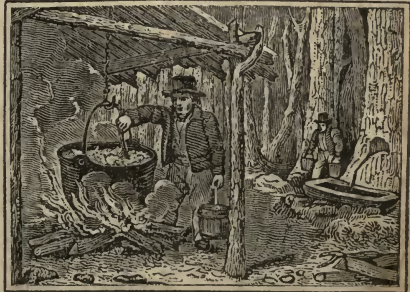
13. To produce crystallization, the liquor is run into broad, shallow coolers, when it begins to granulate. It is then removed again into vessels, contrived to let the sweet moisture, called *molasses*, drain away from it; and then becoming pretty dry, it is called *sugar*; *muscovado*, or *raw sugar*. In this state, it comes to us from the West Indies. The process of refining, by which it is made white, hard, and, as we call it, *lump sugar*, takes place in this country. The essence of the process consists in repeated boilings, which again reduce it to a fluid state, and then it is mingled with substances which cause the scum to rise. When this scum is completely cleansed away, the sirup is, by great heat, crystallized; and being poured into moulds, becomes *lump*, or *loaf sugar*.

14. Sugar is the most nourishing substance in nature; persons have lived upon it in times of scarcity, on board a ship; it is also wholesome, as it in such cases cured the scurvy. The Indians of North America prefer it for their long journeys, because it does not corrupt and spoil, as many sorts of provisions do; and they mix it with an equal quantity of powdered Indian corn. Horses are very fond of it, and are kept in excellent condition by it. It may be added that the plague has never appeared in those countries where it is much in use; and also, that it tends

to hinder the occurrence and virulence of malignant fevers.

15. There are extensive sugar plantations in Louisiana, and great quantities of sugar are exported from New Orleans. The sugar-cane is principally raised upon that tract called the coast, upon the shores of the Gulf of Mexico, and upon the bayous of the Mississippi.

16. Although sugar is most plentifully obtained from the sugar-cane, yet that is not the only vegetable which contains it. It is found in many plants, though in none from which it can be so easily drawn as this. There is in this country a tree called the *Sugar Maple*. This yields it in considerable quantity, though the flavor is by no means equal to that of the cane. In the spring of the year, when the sun begins to draw the sap into the branches, a hole is bored through the bark of the tree: into this is put a spout, and this leads the sap, as it runs, into a vessel placed to catch it. As the south side of the tree first feels the influence of the sun, it is tapped first on that side; afterwards it is bored on the north side, and a fresh sup-



ply is obtained. The quantity of juice or sap which runs in a day varies from one pint to five gallons. This sap is boiled down, skimmed and crystallized, by a pro-

11. How is the juice extracted? 12. Boiled? 13. Crystallized? What is the sweet substance drained from it called? 2. What is the produce of

the cane called, when dried? What is lump sugar, and how is it made? 14. Is sugar a nourishing substance? 15. Are there any sugar plant-

cess well known, and is extensively used in the back settlements. This sugar is as dark in color almost as mahogany.

17. There are many other vegetables from which sugar can be obtained by chemical processes, as beet-root, parsneps, potatoes, red cabbage stalks, &c. but the quantity produced from these is too small to make it an article of commerce.

#### MOLASSES.

18. Molasses is the gross fluid matter that remains of sugar after refining; which no boiling can bring to a consistence more solid than sirup. It is exported in hogsheads from the West Indies, and is perniciously used in the distillation of rum.

#### HONEY.

19. Honey is found in large quantities in a number of vegetables, and is collected and prepared by bees. It is the production of almost every country, but is more abundant in the island of Candia, in the Archipelago, than any where else. Considerable quantities of honey are produced by the wild bees in the woods of North America; and it is sometimes imported from the West Indies in barrels.

### CHAP. V.

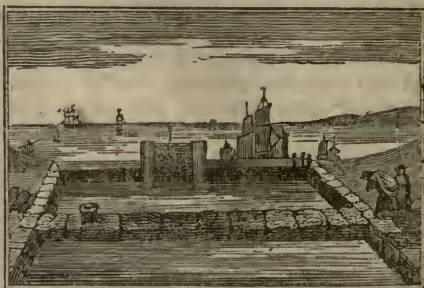
#### SALT, SPICES, &c.

##### SALT.

1. Salt being a substance of actual necessity to man, is widely and plentifully diffused. The salt commonly known by the name of *bay-salt*, is obtained from the water of the sea by evaporation. It had this name from being first made in the bay of St. Ubes, in Portugal; and great quantities of it are still exported from this place.

ations in the United States? 16. Is sugar obtained from any other vegetable? What is maple sugar? 17. Are there any other vegetables from which sugar can be extracted? 18. What is molasses? 19. Honey?

2. In France large shallow pits are dug by the sea-shore, into which the water flows at high-tide; and by a sluice, it is



prevented from returning when the tide falls. The heat of the sun evaporates this water; the salt crystallizes on the edges and bottoms of the pits; and this is carefully gathered up for use.

3. Much salt is prepared in vats at Cape Cod and other places along the sea-coast of the United States. Salt springs abound in the western part of the state of New York; and at Salina, there are large establishments for the manufacture of salt. The salt water is obtained by sinking wells and boring; and the salt prepared is beautifully white and fine-grained.

4. Providence has kindly given mankind great stores of this useful material. Some mountains are composed internally of salt; many pits have been opened in which the miners travel far, among arcades of rock-salt, from among which they obtain large quantities of this valuable article. England, Italy, Poland, have such. The island of Ormuz, in the Persian Gulf, is little else than a mass of salt; vast plains of it are found in America; and it is most likely, that mountains of salt at the bottom of the ocean,

1. What is meant by bay-salt? 2. How is salt obtained in France? 3. Is salt prepared in New England? Are there salt springs in the United States? 4. What else is said of salt? Whence are great quantities brought to the United States?



occasion the saltiness so perceptible in seawater, and by which it is kept from becoming corrupted. Great quantities of salt are brought from Turk's Island, in the West Indies, to the United States.

5. The only mines of rock-salt in England are those in Cheshire. It is there dug out of the mines with pickaxes; and is conveyed by shipping to places where the refiners dissolve it by boiling it in seawater; then, by mixing eggs with it, a scum is made to rise, which is taken off; by longer continuance of the heat, all the water is evaporated, and the pure salt crystallizes, fit for use.

#### PEPPER.

6. Pepper is a small berry, which is ground to a fine powder, to make it convenient for use at the table. The plant on which it grows flourishes in the East Indies, on the coast of Malabar, in Java, Sumatra and Ceylon. It is a feeble creeping plant, and therefore, in cultivation, is placed near some large tree, which may yield it support. The grain, which grows in clusters, appears first green, then red; and is turned black by exposure to the sun. It is best for families to buy the pepper whole, as, in grinding, dealers have opportunity for adulteration. White pepper is a preparation from this, which takes away much of its strength. Sometimes too, that is adulterated; and is even, by art, stained whitish to deceive.

#### ALLSPICE.

7. Allspice or pimento is the aromatic fruit of a tree which grows in Mexico and the West Indies. It is sometimes called Jamaica pepper, and received its name of allspice, because it is similar in smell to cloves, nutmegs and cinnamon.

#### NUTMEGS.

8. The nutmeg is a very aromatic spice. It is the fruit of a tree which grows in the East Indies, and is about the size of

a pear-tree. The nutmeg is the kernel of a fruit, not unlike the peach, and its rind or coat is called mace. The round nutmeg is preferred to that which is oblong. Nutmegs have been long used both for culinary, and medicinal purposes. Distilled with water, they yield a large quantity of essential oil, resembling in flavor the spice itself. The growth of this aromatic is chiefly confined to a few of the Banda Islands, whereof Banda itself, Neira, and Pouloay produce 800,000 lbs. of nutmegs annually. The method of gathering and preparing nutmegs is as follows: When the fruit is ripe, the natives ascend the trees, and gather it by pulling the branches to them with long hooks. The nutmegs when gathered would soon corrupt if they were not watered, or rather pickled, with lime-water made from calcined shell-fish, which is diluted with salt water till it attains some consistence. Into this mixture the nutmegs, contained in small baskets, are plunged two or three times, till they are completely crusted over with the mixture. They are afterwards laid in a heap, where they heat, and lose their superfluous moisture.

#### CINNAMON.

9. Cinnamon is the inner bark of the younger branches of a sort of laurel, which grows in the island of Ceylon, and other parts of the East Indies. *Cassia* is the bark of another sort of laurel. It is thicker and coarser than cinnamon, but of a similar taste. It is mostly imported from China.

#### CLOVES.

10. The clove grows in Amboyna, as it did once over all the Molucca Islands; but the Dutch destroyed those trees, in order to keep all the trade in their own power. It is the unexpanded bud of a tree, similar to the laurel in height, and in the shape of its leaves. It had its name in France

5. Are there any mines of salt in England? 6. What is said of pepper? 7. Allspice? 8. Nut-

because it looks much like a nail, called in French *clou*.

### GINGER.

11. Ginger grows near Calicut, in Asia, but we have it from the West Indies. It is the root of a plant something like our rush. It does not grow deep, but spreads abroad under the surface. It is dug up, when fully grown, and dried as you see it. When preserved, it is boiled with sugar and honey, just as it was dug up green.

## CHAP. VI.

### TEA, COFFEE, &c.

#### TEA.

1. The dry leaves of the tea-plant have become one of the necessities of life. There are many denominations of tea, in commerce; as *Imperial*, *Gunpowder*, *Singlo*, *Hyson*, &c. But the general divisions may be stated thus, *black* and *green* teas. Some travellers tell us, that there is but one sort of plant from which the leaves are taken, and that all the difference is made by their being either young leaves, or fully grown. Yet botanists usually hold, that there are at least two species; differing something in their leaves, and essentially different in their flowers; that of the bohea, or black tea, having six petals; and that of the green tea-shrub having nine.

2. It is said, too, that the finest tea-shrubs grow in Japan, on one particular mountain, which is enclosed with a strong hedge, and wide ditches, and carefully guarded, by persons maintained for this express business. These have a troublesome office, as they are charged not to suffer the dust to remain upon the leaves. They must never breathe on them, nor

touch them with their fingers when they gather them, but must wear very delicate gloves. When this tea is fully prepared, it is conducted, under a strong guard of soldiers, to the emperor's palace; because it is all set apart for his personal use. Of course, this is not the tea which we drink. Indeed, we are not allowed to trade to Japan.

3. The tea we have in America comes from China. And the trade in it forms a very important branch of commerce. The quantity of tea now consumed in the United States is very great, and it increases every year; as the lowest persons of our large population make a part of their meals of it. The quantity brought annually into England thirty years ago was twenty millions of pounds, and nearly as much more goes now to the other nations of Europe. The English government obtains a revenue from what comes to Britain, amounting to between three and four millions of pounds sterling every year.

4. Sixty or seventy years ago tea was scarcely known among the common people. A story is related of a farmer's wife, to whom was sent a present of a pound of tea; and she was so ignorant of the proper mode of using it, that she boiled it all in milk, and the family ate it up, leaves and all, at one meal; declaring it was very good indeed!

5. The use of tea, is comparatively modern. The first that came into Europe was brought by the Dutch, in the year 1610. Fifty years after this, it was introduced in London, at the coffee-houses, as a rarity and a luxury. It was two years longer before some of the private families among the nobility adopted it. At this

megs? 9. Cinnamon? Cassia? 10. Where does the clove grow? What is it? Whence had it its name? 11. What can you say of ginger?

1. Are there many kinds of tea? 2. Where is

the finest tea said to grow? How is this tea cultivated? 3. Whence does our tea come? Do we use much? Does much go to Europe? 4. Was tea much known sixty years ago? 5. When was



time, it was sold at sixty shillings per pound; it could not therefore come into common use. As greater quantities were brought over, the price was lowered; and the use gradually increased; till it is now become almost one of the necessities of life to people even in the humblest stations.

6. The plant which produces tea will grow, if permitted, to ten or twelve feet in height; but in China, where it is very carefully cultivated, it is kept much lower. They dibble the seeds into the earth in regular rows. They will then grow with only the care of pruning, and weeding. Some of the cultivators richly manure



the soil; for the Chinese are as careful of their tea-plants, as Europeans are of their vines.

7. The plant must be three years old, before the leaves are fit for use; and when it has borne for about an equal length of time, the leaves get so coarse and hard as not to be worth cultivating any longer. The plant must then be cut down almost to the ground; this will occasion a new set of shoots to arise, which, in their turn, yield young and excellent leaves for several seasons. The flower which it bears is not very splendid. Neither is the fruit of it of any use. It bears a sort of triple berry; we now and then find one among the tea.

tea brought into Europe? How was it sold? 6. What of the plant which produces tea? 7. How old must it be before the leaves are fit to gather?

8. The plant is cultivated to best advantage on the side slopes of hills which face the sun: or in warm valleys, adjacent to the banks of rivers. It will, however, grow even in rocky places, and on strong soils; where, indeed, the finest leaves are produced. The Chinese do not suffer a single inch of ground to remain barren. It will grow in the northern parts of the empire; but it flourishes best in the milder provinces of the south.

9. There are three seasons for gathering the leaves. The first is about the beginning of March, when the leaves are very small, and not a week old. This is called *imperial tea*, and is reserved for the emperor and the *grandees*, who only can afford to pay for it; the produce being small, the price must be the greater. The persons who gather these leaves cannot pick them by handfuls, but only one by one; and they must be very careful not to break or damage them, in the least.

10. The second crop becomes fit for use about a month after the first, at the beginning of April. At this time some leaves are fully grown, and others are still young; they are, however, all plucked, and afterwards sorted. The smaller sort are often sold, as belonging to the first crop, at a high price.

11. The country is all alive in this business, when the third and principal gathering takes place, which is in the month of June; then the leaves are very numerous, and have attained their full size. This tea is consequently of a coarser flavor, and lower price.

12. Those who do not make these three gatherings, but only two, or even only one, yet sort out the leaves into several parcels, according to their size and delicacy. These gatherings take place on those lands where the plant is regularly cultivated.

8. Where is it best cultivated? 9. What are the seasons for gathering the leaves? What of the first crop? 10. The second? 11. The third?



But it also grows wild in great abundance, and often to superior excellence, upon the steep sides of mountains and rocks, where it is almost or quite impossible to reach them. A singular method of obtaining the leaves growing in these difficult places, is resorted to. Although these rough spots are inaccessible to men, they are, for that very reason, inhabited by large troops of monkeys. Now monkeys are not only imitative creatures, but also very irascible; the silly creatures are easily provoked into a violent passion, and in that state they seek all the revenge in their power. The people, therefore, get as near as they can to their haunts, and provoke them, by pelting them with stones. In revenge, the monkeys break off large branches of the



trees, among which they clamber and chatter, and with these they pelt their enemies. These are carefully picked up, and the leaves stripped off them for use.

13. But these leaves are not yet fit for use. They must be dried, curled, and rolled up, to make them as we see. Those who cultivate the tea-plant on a large scale have an apparatus for these purposes. But as many have not, there are public drying-houses, to which any one may take his leaves, be they few or many, and have them properly cured. These buildings are

provided with small stoves, covered with iron plates, which are thereby heated to the proper degree.

14. On these heated plates, a few pounds of leaves are placed, and constantly stirred with the fingers. The leaves, being very moist, crackle, curl, and dry. When they become too hot for the hand to bear, they are shovelled off the iron plates upon mats, spread on a table, around which the workmen sit, whose business it is to roll them in the palms of their hands, (always moving them one way) to curl them up, regularly and closely. By repeating this process several times, the leaves are rendered perfectly dry, and are fit to be placed in the warehouses for sale. Yet it is reckoned safest to keep the tea there a full year, before it is actually used.

15. The tea comes to us packed close in wooden chests, which are lined with a very thin sheet of lead, in order to keep it entirely from the air, which would soon exhale all its fine flavor. The tea is brought to Canton, in the southern part of China, the only port at which we are allowed to trade. There the merchants



deal with the agents who purchase it; and from thence it is brought in ships, direct for the United States.

16. The Chinese drink tea, not as one  
scribe the process further. 15. How is the tea brought to us, and from whence? 16. Do the Chinese drink much tea? What do the people

12. Does the plant grow wild? How is it obtained from such inaccessible places? 13. Must the leaves be dried? How are they dried? 14. De-

specific meal, as we do, but all day long; at every meal, and whenever they are thirsty. They drink the pure tea, in a strong infusion, without sugar—although they have sugar—and without milk. I think, we are much wiser in putting to it these salutary mixtures; they give it some nourishment, and blunt, in a considerable degree, the too violent effect it would have upon the nerves. It is said, indeed, that the waters of China are unwholesome, and that their evil influence is averted by the tea. The people of Japan sometimes grind the tea to a fine powder; then they serve out warm water in cups, to their guests, each of whom takes, on the point of a knife, as much of the powdered tea as is agreeable, throwing it into the cup, and, after stirring it about thoroughly, drinks it.

17. Those who have written upon tea are much divided in their opinions; some calling it little short of poison, while others are loud in its praise. Perhaps the difference of constitutions makes the chief difference in its effects. That tea is exhilarating, every one knows, especially after considerable fatigue; it seems, therefore, to have ready access to the nerves; for which reason, nervous and weakly people, though very fond of it, should deny themselves, and be sparing of an indulgence so fascinating, but so insidious.

18. The story of the destruction of the tea in Boston harbor, in 1773, is doubtless familiar to you. A tax of three pence a pound being retained on tea, the Americans resolved to prevent the importation of the article rather than pay a duty, which they believed to be unjust. Immense cargoes were sent to America by the English East India Company, but the colonists refused to receive them. Several

vessels having arrived in Boston harbor laden with tea, a number of persons, dressed like Indians, went on board the ships, and staved and emptied into the sea about three hundred and fifty chests.

#### COFFEE.

19. The coffee-tree is said to be a native of Arabia Felix. It was in very early repute at Mocha, a port situated at the entrance of the Red Sea, to which place coffee was brought from all the neighboring districts, for exportation. To this day, Mocha coffee is considered the best in flavor, as it is the most expensive in price. Excellent coffee is obtained at the island of Java. Coffee was introduced into the West Indies in 1727, and great quantities of it are now raised there. Brazil also furnishes an abundance.

20. The coffee-tree, if left to grow wild, will rise to the height of sixteen or eighteen feet; but when cultivated, it is found more convenient to keep it down to five or six feet. To do this, it is planted in rows, the plants about eight feet distant from each other. When topped, to prevent their rising too high, they spread out their branches widely, so as to cover the spaces between them.

21. The flower of the coffee-tree forms a cluster, at the root of the leaves; it is white, and very fragrant, and of a funnel shape. The fruit, or berry, looks something like a cherry, but is oval. When ripe, it is of a deep red. They should be obtained by shaking the tree; then all that fall are ripe. This berry is conveyed between three wooden rollers, the pressure of which gently cracks it into its two parts, and clears it from its outer skin. There is still a thin skin, called the *parchment*, which is taken off by another mill. When wholly cleared of broken bits and

of Japan? 17. What is said of the effect of tea-drinking? 18. Is tea anywise connected with the story of our revolution? 19. Of what country

is coffee said to be a native? What is said of Mocha? Java? The West Indies? Brazil? 20. What of the coffee-tree? 21. Its flower and fruit?



offal, it is fit for sale. But you see, though brown, it is not very dark.

22. Who first thought of making a drink from the coffee berry, cannot now be known. It is said, that an Arab goat-herd, observing that his kids appeared particularly lively after browsing upon the tree, so as to be wakeful, and capering, all the night after, happened to mention the circumstance to the prior of a neighboring monastery, who determined to try if it would not keep his monks awake, who were all apt to nod at their early morning prayers.

23. Some Mohammedan dervishes next took to it, to enable them to spend all night in their devotions. Studious persons, who wished to be wakeful, found it exhilarating and refreshing. From Mecca it passed to Cairo; and thus it has spread, at last, over the civilized world. Its use in the East, to counteract opium, is very great.

24. The French traveller, Thevenot, brought it from Persia into France; and the Greek servant of an English Turkey merchant brought it into England, and opened a house for the sale of it. At first, it was called in Europe, *Sirup of the Indian mulberry*, and was thought nice, of course. It is in general use in the East, and is esteemed so much a necessary of life, that it is one of the things which a Mohammedan is obliged to supply his wife with, at all events.

25. To prepare coffee for use it must be roasted, and then ground in a mill. The excellence of coffee depends in a great measure on the skill exercised in roasting it. In Europe, it is usually roasted in a cylindrical tin box, perforated with numerous holes, and fixed upon a spit, which runs lengthwise through the centre,

and is turned by a jack, or by the hand. The best coffee is made in France.

#### CHOCOLATE.

26. Chocolate is a kind of cake, or hard paste, which is prepared chiefly from the pulp of the cacao or chocolate-nut, a production of the West Indies and South America. The cacao-tree, both in size and shape, somewhat resembles a young cherry-tree, but separates, near the ground into four or five stems. The fruit of the cacao-tree is similar to a cucumber in shape. As soon as it is ripe, it is gathered, and cut into slices; the nuts are then taken out and dried. When perfectly dry, they are put into bags, and exported to foreign countries. Before they are made into chocolate, these nuts are generally parched over the fire in an iron vessel. The kernel is then pounded in a mortar, and subsequently ground on a smooth, warm stone. Sometimes a little *arnatto*, a dying drug of South America, is added, and with the aid of water, the whole is formed into a paste. This is put, whilst hot, into tin moulds, where, in a short time, it congeals; and in this state, it is the chocolate of the shops.

27. The French have a method of preparing chocolate, with sugar, and sell it in small rolls of two or three inches in length. It has an agreeable taste when eaten in this state, and mixed with water is very rich, and has a delightful flavor. The chocolate thus prepared is made into a multitude of fanciful forms and sold in the shops of Paris. In the Palais Royal, you may see the windows filled with chocolate images, of heathen gods and goddesses, men and women, chairs, tables, pitchers, &c. all of which are destined to be eaten.

28. The *shells* of commerce are the

The berry? 22. What is the story of the Arab and his kids? 23. The Mohammedan dervishes? 24. By whom was coffee brought to Europe?

What was it at first called? 25. What of the preparing of coffee? 26. What is chocolate? Describe the process of making it. 27. Have the



outside covering of the small cacao-nut; when properly prepared this forms an agreeable beverage

29. The infusion of cacao-nut is itself an article of much consumption as a drink, and a method has recently been introduced of crushing and preparing the nut in a peculiar manner, so that without the process of manufacturing it into what is called chocolate, it makes a drink of great richness and fine flavor. A plantation of it is a long time coming to maturity, and is liable to be affected by every casualty. When however a plantation has arrived at full growth it is considered a valuable inheritance.

## CHAP. VII.

### CIDER, BEER, &c.

#### CIDER.

1. Cider is a well known drink extracted from the juice of apples. The preparation of this liquor forms an interesting portion of agricultural labor in this country. It is also an article of considerable commerce. The first process is to collect the fruit into heaps, where it ferments, and becomes perfectly ripe. The apples are then taken to the mill, and being ground, are made to yield a liquor, which is afterwards put into casks, and prepared for use. The best cider manufactured in the United States is said to be that of New Jersey. In the country towns of New England, cider is used in almost every house. In common seasons, it is worth little more than a dollar a barrel. It is a slightly intoxicating liquor, but is seldom taken in a quantity sufficient to intoxicate.

#### PERRY.

2. Perry is a beverage made from pears, by a process similar to the manufacture

French any peculiar method of preparing chocolate? 23. What of shells? 29. What of the cacao-nut?

1. What can you say of cider? Is it much used

of cider. It is a wholesome and pleasant liquor, and has sometimes been made so excellent as to pass for Champagne. Pears should be fully ripe before they are ground. Crab apples are frequently mixed with the pears, and are said to improve the perry.

#### BEER, ALE, &c

3. Beer is a generic term for drink extracted from malt. It is a very ancient liquor, and is said to have been invented by the Egyptians. Malt is prepared by a peculiar process from barley.

4. Brewing is the art of gaining from malt all its sugary sweetness, and, by fermenting it, making it into a sort of vinous liquor.

5. The general mode of operation is as follows. The first part is mashing. This consists of pouring water which has boiled, but is now cooled down to a proper heat, upon the ground malt, in a deep open vessel, or tun, and stirring it well about. If the water were boiling, it would not dissolve it properly. When it has been mashed for two or three hours, the liquor, sweet-wort as it is called, is drawn off. Hot water is a second time poured upon the malt, and drawn off. Also a third time. If you mix the two first worts together, they will make good ale; the third will then be small beer. If you mix the two last together, they will make excellent table beer; and the first wort alone will be capital ale.

6. When all the strength is thus gained out of the malt, the liquor is then to be boiled up with a proper proportion of hops. The worts alone would make a ropy liquor, which would in a few weeks turn sour: the hops tend to break the viscosity of the ale; to give it that flavor of bitterness, which is so pleasant to the palate; and to

in New England? 2. What is perry? 3. What do you mean by the word beer? 4. What is the art of brewing? 5. Describe the mode of operation. 6. When the strength of the malt is ex-

make it keep for months, or years, without turning sour.

7. After it is boiled with hops it must be worked, that is, made to ferment. The wort must be in a proper state of warmth for this: too much heat or cold will spoil it. A quantity of yeast, spread upon a toast, is set a swimming in the middle of the cooler.

8. When the fermentation is evidently getting on, then the whole liquor is to be tunned, that is, put into the vessels in which it is to stand, till drawn off for use. These vessels are filled, and as the fermentation proceeds, it throws over at the bung-hole a brown froth, which is yeast, fit for setting other beer at work, but especially useful in making bread.

9. The art of making the ale good will now consist in knowing when to stop the fermentation. Were you to close the bungs of the vessels at first, the force of the gas set at liberty by the ferment would burst the vessels. On the other hand, if it were not to be bunged up till it had quite done working, the liquor would be flat, as all its spirit and strength would have escaped. The object is to bung it up as soon as the first violence is over, and keep in all the spirit you can without bursting the cask.

10. After awhile, the liquor, which is now thick, or turbid, will fine itself; that is, all the mash of the malt will sink down into lees, a sort of mud, at the bottom; and the body of the ale will become clear and sparkling. The stronger the ale is, the longer must it be kept before it will be fine enough to drink: three months, or even twelve.

11. The general principles of brewing ale have now been stated. Beer is similar in its process, and so is porter; the chief difference lies in the materials put in to

give it either color or peculiar flavor. The brewers are said to have secrets, in these respects, which they do not wish the public to know. There are many places in New England and the Middle States, where beer and ale of excellent quality are made; and the brewing of them is quite extensive in the United States.

#### PORTER.

12. Porter is said to receive its deep brown from Spanish liquorice, or from burnt sugar. The English Porter is generally esteemed superior to that of any other country; but it is made in nearly equal perfection in America.

### CHAP. VIII.

#### WINES.

1. A great number of vegetable substances may be made to afford wine, as currants, cherries, &c; but that obtained from the fruit of the vine is the best and most drank. There are many sorts of wine, because there are many countries where the vines grow luxuriantly; and each has its own peculiar flavor. Sometimes this excellence is confined to a single hill; and sometimes it extends over a whole country.

2. TOKAY WINE, for instance, is, if genuine, the produce of only a small district in Hungary; the whole of which is (or ought to be) reserved for the emperor's use. However, Tokay wine, or something having that name, may be bought at any time in our large cities, and in any quantity.

3. MADEIRA. The true Madeira wine is made at Madeira, an island lying north-west of the coast of Africa. As the wine of Madeira stands so high in repute, a little account of the vineyards in that island, and the mode of cultivation, may amuse you. In every spot, where the soil

hausted, what is done? 7. After it is boiled with hops? 8. Describe the continuation of the progress. 9. How is the ale now improved? 10. How

long must the ale be kept? 11. What is said of beer and porter?

1. From what fruits are the most esteemed



is suitable, and a due exposure to the sun affords sufficient warmth, the vines are planted. Low stone walls enclose the several walks, which cross each other from one side of the vineyard to the other. These walks have a kind of trellis-work of laths and bamboos, which almost meet at the top, and render them delightfully shady. It is the ripening of the grapes in the shade, which is said to give them their peculiar flavor. The vines are thus supported; and the keepers can clean the ground of every weed with the utmost ease. Every vineyard has a plantation of bamboos adjoining, as the grapes will not prove excellent without this shade and support. The external hedges which defend these vineyards are composed of the prickly pear, myrtles, brambles, and wild roses: so that the whole country has the appearance of a garden.

4. Besides what may be consumed at home, the islanders export sometimes forty thousand pipes of wine in a year; each worth from one hundred to two hundred dollars. Some of our East-India ships take a great quantity in their outward voyage, and bring it back to America. The voyage and the warmth ripen and improve the wine much. In its native state, as brought immediately from the island, Madeira wine is worth very little. There are, besides this description of the wine, Burgundy Madeira, Sicily Madeira, and Malmsey Madeira, a white, luscious, and highly palatable wine. The vine which produces malmsey wine, properly so called, is a native of Malvasia, a small Grecian island where its cultivation is at present but little attended to.

5. At Teneriffe, one of the Canary Isles, great quantities of good wine are made, which may be obtained at less than half

the price of Madeira; and to some palates it is more agreeable.

6. In Madeira, the grapes are gathered when ripe, and put into wooden vessels. Then, to press out the juice, the vintagers strip off their jackets, and their shoes, and get into the vessels; there, working with their hands, and feet, and elbows, they press and squeeze, till every grape is crushed.

7. When they have obtained the juice clear from the stalks, it does not want sugar; for the grapes are so very ripe and sweet, that the liquor presently ferments. It is the sugary substance in the grape, which, by fermenting, evolves a vinous spirit, and produces, after long standing, (which ripens and clears it) the liquor we call wine.

8. PORT WINE. What we call *Red Port*, comes from Oporto, a city of Portugal. The vines grow in the surrounding country. The quantity exported annually is said to be eighty thousand pipes. It is a trade of considerable importance to the Portuguese. Some of the wine merchants at Oporto have cellars which will contain six or seven thousand pipes; a great number of the inhabitants employ themselves as coopers.

9. SPANISH WINE. What is with us called *Sherry*, comes, if genuine, from Xeres in Spain, where forty thousand pipes of it are annually made. There are two kinds of this wine, the pale and the golden. The Sherry wines are shipped for the most part at Cadiz.

10. Other Spanish wines are in great request. *Mountain* wine is made from the vines around Malaga. It has this name if white; the red wine, made in the same district, is in repute with us as very luscious, under the name of *Tent Wine*,

wines obtained? 2. What of Tokay? 3. Madeira? What is said of the vineyards in Madeira? 4. Is much wine exported from Madeira? 5. What of

Canary or Teneriffe wine? 6. What is done with the grapes in Madeira? 7. Is sugar needed to sweeten the wine? 8. Whence do we obtain



called there *Vinc tinto*, that is, tinted, or colored wine. There are fourteen thousand wine-presses in this province, so that the produce must be immense.

11. **VINES IN ITALY.** The plains of *Lombardy*, in the centre of the upper part of Italy, are nearly one continued vineyard. The vine in this country too appears with unusual luxuriance, not being tied to stakes, and cut down to dwarf plants, as in France; but suffered to grow as it pleases, climbing up the tallest elms, and hanging in rich festoons from tree to tree, all about, and almost encumbering the



traveller's pathway. The sight is extremely picturesque and gratifying.

12. When the vine runs to this extent, it sometimes bears bunches in proportion. Something of this kind must have been common in *Canaan*, when the spies brought home one cluster, so large as to be borne between two persons on a staff.

13. **FRENCH WINES.** But the most luxurious wine countries are in France. In the South, the vineyard forms the farm, and the produce constitutes the grand harvest, called the *vintage*; a joyous season, as well it may be, especially if the weather has been favorable to the abundance and ripening of the fruit.

14. *Champagne* is a wine produced in the northeastern part of France, from a

province which was once called by that name. The wine is of exquisite flavor, rich, and racy; it is in high repute, and bears a considerable price.

15. The country once called *Burgundy*, lies south of *Champagne*, and gives its name to a wine much celebrated for its beautiful color and delightful flavor.

16. *Claret* is a French wine of a pale red, as its name implies, brisk and sparkling. It comes from the country about the *Garonne*, on the western coast of France.

17. A journey through the wine countries of France, in the vintage season, is very gladdening. In the eastern and southern departments especially, the vines are seen every where, crowning the warmer slopes of the sunny hills, league after league. The vines do not need a house or a wall to assist in ripening the grapes; the warmth of the atmosphere is sufficient, during the summer months. The vines are kept short. They are planted within five or six feet of each other, in regular rows. As they grow, two stakes, about four or five feet high from the ground, must be planted to each vine, at a little distance to the right and left. To these stakes the principal shoots of the vines are tied; all others, which will not tie in, are cut off to two or three eyes, (as they call the buds,) according to the strength of the branch. By this means, none of the fruit can trail upon the ground, for that would rot and spoil the grapes.

18. Very carefully is all the ground between the rows dug, at the proper seasons; and kept clear of weeds, from the time that the vines begin to bud. And continually is the pruning-knife used, to cut off all the shoots which are not intended to be left for fruit; in order that the whole strength of the plant may be forced

Port wine? 9. Sherry? 10. Malaga? 11, 12. What of vines in Italy? 13. What of French

wines? 14. Champagne? 15. Burgundy? 16. Claret? 17. What is said of the vintage season

into the branches which remain, to make the grapes large and fine.

19. This season may well be anxious, because, not unfrequently, storms of thunder, rain, and hail, arise, in a manner so fierce as to destroy all the peasant's hopes at once; the labor of the whole season is frustrated in a single hour. The calamity is ruinous. The whole produce is, for that year, cut off; and nothing but poverty and suffering, all through the winter are before the miserable inhabitants.

20. If, however, the season continue propitious and the vintage sets in pleasantly, then the whole country is alive; lads and lasses, with the old and young of both sexes, join their labors with the greatest alacrity. The vines are stripped of their purple clusters, which are borne home triumphantly in baskets, or in wagons, by



the singing, dancing, revelling, troops of villagers, exhibiting, at the present day, something like the Bacchanalian vagaries of heathen times; the girls dressed up with flowers, and the lads with vine leaves. The wagons, fantastically decked with boughs, are drawn by oxen, and attended by the shouting multitude, with all the music the village can afford, making the scene highly interesting and exhilarating, not only to those engaged in it, but even to a looker-

on in France? 18. Are the vines carefully tended? 19. Are the hopes of the vintagers often destroyed? 20. If the season is propitious? 21. What of Hock? 22. What of the color of wines? What

on. It is the hey-day of rural festivity. The flowing bowl circulates; abounding plenty enlivens; and the very labor itself rejoices the heart.

21. HOCK. Hock is a German wine of excellent flavor when old. The best comes from Frankfort on the Maine, whence it is exported in casks called *aumes*.

22. COLOR OF WINE, &c. To give a deep red color to wine, it is necessary to make use of black grapes. The color of wine is, however, often artificial. Redwood, logwood, elder berries &c. are used in dying it. It is sometimes the practice to throw sugar of lead and alum into sour wine in order to sweeten it. These substances are extremely injurious.

23. Dealers distinguish wine into two general descriptions; namely, *sweet* or *luscious wines*, and *dry wines*, or such as are not sweet.

## CHAP. IX.

### DISTILLED SPIRITS.

#### BRANDY.

1. The difference between distilled and fermented liquors is important. Wine is fermented; in this process an ardent spirit, called alcohol, is generated; this mingles through the whole substance of the liquor, ripens by age, and makes it wine. The purpose of distillation is to separate this ardent spirit from the watery parts of the wine; and thus produce a liquor much more filled with alcohol, in which it is concentrated, and bears a much greater proportion to the bulk of the fluid. In order to this, it is put into an apparatus called a *still*, and subjected to considerable heat. This heat presently raises the spirituous part, or the alcohol, into vapor, which rises, and would be lost in the at-

is sometimes done in order to sweeten wine? 23. What is meant by dry wines?

1. What is the difference between distilled and fermented liquors? 3, 4, 5. Describe the process



mosphere, were not the apparatus contrived so as to condense, and retain it.

2. The vapors rise to escape by a narrow tube, which is carried to a great length through a large quantity of water; the pipe is cooled by this chill, the steam is condensed into drops, and, at the ex-



tremity, runs out in a stream of spirituous liquor. The liquor, treated thus repeatedly, will lose most of its watery particles, and, at last, become pure spirit, called in commerce, *spirit of wine*.

3. Distillation produces alcohol very similar in its properties, let the substance distilled from be what it may. In England, the spirit is usually produced from malt. The specific flavor, and color are given afterwards in a process called *Rectification*.

4. As we are speaking of French brandy, it is proper to observe, that this is distilled from wines. Wines beginning to get tart will do. Nay, even the grape-stalks, and the refuse, will yet afford the brandy spirit, if treated properly.

5. All this refuse used to be cast away as worthless; but they have learned to use it. After the juice has been well squeezed from the stalks and husks, the whole mass is lightly loosened, and put into vessels, with a certain proportion of water; it is then covered over with clay, to prevent any of the fermentation from escaping; in this confined state, it is kept four or five

of distillation. 6. In what part of France is the

weeks; the whole is then distilled, and the produce of spirit is considerable.

6. The part of France where brandy is said to be produced of the finest kind and best flavor, is in the western borders, about Nantz; and the town of Cognac is famous for it. It is at first colorless, and is said to attain its tint from the wood, by standing a year or two in the vessel. This long keeping tends also, by a continued internal commotion, to ripen or soften it, and take off much of that fiery quality, which burns the throat when brandies are new. It is said, that not less than fifty thousand pipes of brandy are made every year in France.

7. The intemperate use of brandy and other spirituous liquors is productive of the most injurious effects both to the body and soul of man. The amount of misery and disease it has caused in the world, is incalculable. The strongest constitutions have been enervated and destroyed by its pernicious influence; and the noblest minds have been prostrated by its degrading power.

#### GIN.

8. The name of *Geneva* is given to this liquor because, originally, it was flavored with juniper berries, the French word for which is *genévie*. It was in Holland that this liquor was first made; and the only true Geneva is distilled there now. The English gin is nothing more than malt spirits flavored with oil of turpentine, and they are distilled together. It is a destructive drink among the lower classes.

#### RUM.

9. Rum is a spirituous liquor distilled from the sugar-cane. When the juice of the cane has been forcibly pressed out for sugar, the mashed cane and all the refuse are put into the still. The produce is a very powerful spirit, called *Rum*. This spirit is mixed with much of the oil of

best brandy produced? 8. What of gin? 9. Rum?



the sugar-cane, from which it receives its peculiar flavor. Sometimes in distilling the rum, a few pine apples are added. The rum manufactured in Jamaica is highly valued. Rum is distilled from molasses in great quantities in New England, and exported to Europe and other countries in hogsheads. This deleterious spirit is sold so cheap in America, that the wages of a day's labor will purchase three gallons of it. Three-fourths of the poverty and crime that lead to the almshouse and the penitentiary, spring from this fruitful source.

#### WHISKEY, &c.

10. Whiskey is obtained by distillation from corn, rye, wheat, sugar or molasses, though generally from the former. It is made in great quantities in Ireland and Scotland; as well as in Ohio and some of the middle and western states.

#### ARRACK.

11. *Arrack* is an East India liquor, procured from rice, when made at Batavia; and from the juice of cocoa-nuts by the people of Goa.

12. There are various kinds of cordials, such as Noyau, Annisseed, Mareschino, &c., which are considered articles of commerce. But the basis of these liquors is most commonly some one of the above spirits, and they are flavored and colored by vegetable substances. Brandy and rum are often impregnated with the juice of the common wild cherry, and in this state they are much drank.

### CHAP. X.

#### ARTICLES OF CLOTHING.

##### WOOL.

1. The fleeces of sheep seem to have been the first resource of mankind for

clothing. Adam and Eve had skins for their garments, after sin had made a cover-



ing necessary. The art of forming cloth of the wool is very ancient; for Naamah, sister of Tubal Cain, of whom we read *Genesis*, iv. 22, is said by the Jewish writers to have invented spinning and weaving; and it is most likely that wool was the first material.

2. In the book of *Leviticus*, we find distinct mention both of the warp and of the woof; which describes the woollen cloth to be made as in modern times.

3. The wool of Attica, in Greece, and of Tarentum in Italy, were in high esteem with the ancients. And garments were dyed purple by the people of Tyre, of great value for magistrates and kings. That was the *Imperial purple*, which none else might wear.

4. There has been a considerable trade therefore always in an article so necessary and so costly. From Syria these commodities were brought, in great abundance, towards Europe.

5. The Roman *toga* was a woollen garment, white, fine in its texture, and ample in its folds. The best materials, from all their provinces, were drawn to the metropolis. There alone was to be found the wealth which could pay for every thing luxurious.

10. Whiskey? 11. Arrack? 12. What of cordials?

1, 2. What is said of the antiquity of woollen

cloth? 3. The purple garments of Tyre? 4. The trade in this article? 5. The Roman toga? 6. Did the Romans establish the manufacture in

6. Wherever the Romans took up their abode, they brought and established some of their arts; so that the nations which they conquered were in fact enriched. In Britain, Winchester was the seat of their woollen manufacture; and here it was conducted on a scale sufficient to supply their army. The business was not wholly lost, when, in the fifth century, they abandoned Britain; yet it went very much into decay; for we find one of the most important acts of Edward III., in the fifteenth century, (a thousand years after the Romans left England,) was the inviting over from Flanders, and establishing in England, wool-combers and weavers, who could teach his subjects how to work up their own excellent fleeces.

7. It seems, that the wool trade was all against them at that period. Merchants from the Netherlands used to come over to England to buy up all the fine unwrought wools, which they took home; and when they had woven, dyed, and dressed them, they returned with their cloths, and sold to the English their own fleeces, at an exorbitant advance of price. Edward, on a visit to Flanders, saw in what a princely style these merchants and manufacturers lived; and he thought, and thought truly, that if his people could be taught to work up their own wools, much money might be detained in the kingdom, which now went abroad, to the great impoverishment of his own people, and the enriching of foreigners. His scheme succeeded; and the English became so expert in the manufacture, that, in Queen Elizabeth's time, a law was made prohibiting entirely all exportation of unmanufactured wool.

8. Yorkshire is now the principal seat of the English woollen manufactures, espe-

cially of broad cloths; and Leeds is the central mart, where most of the wholesale business is transacted.

9. It is supposed there are about thirty million of sheep in the kingdom of Great Britain; the wool of them, on an average, is worth about seven millions of pounds sterling, the value of which is increased, by manufacturing skill and labor, to between twenty and thirty millions sterling. To this may be added five millions pounds weight of foreign wool. This great manufacture is supposed to give employment and maintenance to more than three millions of persons, men, women, boys, and girls.

10. Spanish wool, at least that of the merino breed, seems to be in favor, as of the finest texture. Those sheep crop the short sweet grass of the mountains, and their wool, though not so abundant, is of a more delicate quality. The Spanish breed is said to have sprung from a few sent as a present from England, by Henry II.

11. The manufacture of wool in the United States is very considerable, and is yearly improving and increasing. The sheep of New England produce a wool of a very excellent quality, which is woven into various kinds of fabrics. Fine broad cloth is woven at Lowell, and at several other of our manufacturing towns.

12. The fabrics formed of wool are very various. The *superfine broad cloth*, of which our coats are made, stands at the head of the list; then come *narrow cloths*, which are of a coarser texture. Flannels, blankets &c. are also made of wool: indeed so many are its uses, that it would be tedious to enumerate them. Many elegant fabrics are formed by a small mixture of wool with other articles. Poplins and

Britain? 7. What induced Edward to encourage the manufacture? 8. What is now the chief seat of the English woollen manufactures? 9. How

many sheep are estimated to be now in Great Britain? 10. What of the Spanish wool? 11. What of the manufacture of wool in the United



ustres have some silk in them; and some flannels have a little cotton mingled.

#### SHAWLS.

13. The finest shawls are imported from the East Indies. Cachemere is the great seat of the manufacture of those beautiful shawls, which bear the name of this province. These shawls are of two sorts: those of the first sort are made from the wool of the country, which is finer than that of Spain; and those of the second sort from the wool, or rather hair, taken from the breasts of the wild goats, which inhabit Great Thibet. The shawls of the second sort are much dearer than those of the first, no beaver being more delicate than they are. In Russia shawls of an excellent quality are made, called Moscow shawls.

#### CAMLETS.

14. Camlets are of various colors and sorts; some of goats' hair, both in the warp and woof; others, in which the warp is of hair, and the woof half hair, and half silk. Camlets are manufactured both in France and Great Britain.

#### BOMBAZINE, &c.

15. This is a kind of silk and woollen stuff originally manufactured at Milan, and thence sent into France and other countries. It is now made in Great Britain as well as in this country. *Kersey* is a species of coarse woollen stuff usually woven in ribs. Long wools are those mostly used in the manufacture of this article.

### CHAP. XI.

#### ARTICLES OF CLOTHING &c.—CONTINUED.

#### COTTON.

1. Cotton is a soft vegetable down, which is the product of a small tree, about the size of a currant bush. It makes a light, cheap and cleanly garment; and, in many

respects, is preferable to wool: although wool will always be in esteem, where warmth is the especial convenience sought after.

2. The cotton plant, which has become of so much importance to our manufactures, would naturally grow to eight or ten feet in height; but the cultivators find that it never bears its downy fruit in so great



abundance as when it is kept to about four feet. In the cotton plantations, the plot is regularly laid out, and holes are made for the seeds, at the distance of seven or eight feet from each other. Into each of these, several seeds are dropped, though all are not suffered to grow, the weaker ones being pulled up as soon as the planter can discern which are likely to thrive best; so that only two or three are left in each spot. As these plants grow, they are pruned, as no fruit would appear either soon, or plentiful, if they were allowed to run wild. This pruning process, and gathering of the crops, continues about three years, when the plant is so worn out, that a new one is more productive. The cotton fruit is gathered in March or April.

3. This fruit is a brown pod bearing a seed, enveloped in a downy covering. The seeds are separated by a machine called the cotton gin, and the woolly covering, which is the cotton itself, is preserved for sale.

States? 12. The fabrics formed of wool? 13. Shawls? 14. Camlets? 15. Bombazine?

1. What is cotton? 2. What is said of the cotton plant? When is the cotton gathered? 3. De-



4. Cotton was found growing naturally in America; and the Southern States now supply immense quantities of the article. The plant is also much cultivated in the countries of the Levant, or eastern part of the Mediterranean; as the Morea, Candia, Cyprus, and the islands of Sicily, Malta, &c.; also in the country about Jerusalem and Damascus. It is also raised in the West Indies, and in Brazil and other parts of South America.

5. When gathered to be exported the cotton is packed in a curious manner: large bags are provided, two or three yards in length, and above a yard in width. The mouth of this bag is held open, by two cross pieces of timber to which it is fastened, and supported by posts strong and high. The packer gets into this deep bag, to the bottom of it; while another hands to him small parcels of cotton continually; these he places, treads down, and forces into as small a compass as possible. The bag, when thus crammed, will contain three or four hundred weight.

6. Cotton being a very light commodity, one grand object has been to reduce it in bulk; that a ship might be able to hold a larger quantity, and so make her voyage more profitable. To accomplish this, machinery of very powerful pressure has been invented, by which the cotton is reduced into one-thirtieth part of the bulk to which common packing could bring it. It lies so close now as to be almost solid; but it recovers its usual springy lightness on being unpacked and pulled out.

7. The whole process in the manufacturing of cotton has been so improved of late years, by ingenious machinery, as to be totally changed. By this means, it can be afforded cheaper at the market; a much larger quantity is thus disposed of; and the

trade has become a great source of emolument while it affords employment to many people. The English are able, even to fetch the cotton from India, work it up into muslins, send it back again all that way, and sell it in Hindoostan cheaper than the natives can produce it on the spot.

8. The ladies who wear those fine delicate India muslins, would be surprised to see in what an inartificial manner they are woven, by a people whose loom is so clumsy as scarcely to deserve the name of machinery. The Indian weaver works in the open air; he takes his apparatus under the shade of some tree, where he incessantly plies his adroit fingers. His progress is tediously slow, but it is patiently persevering. He can live upon a little, and is content with his monotonous employment; as was his father before him.

9. The first process with the cotton, when unpacked, is that of carding, in order to prepare it for spinning. This consists in tearing it asunder, by means of a board set with steel hooks, in which the flaky cotton is entangled, and from which it is forced out by another instrument of the same description, which, being drawn the reverse way, tears open the compressed substance of the cotton, and brings it into the state of fine wool.

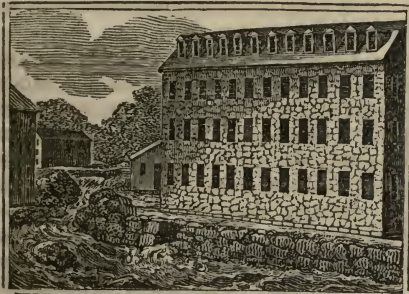
10. This carding is now effected by very ingenious machinery, by means of which the work is expedited in an astonishing degree, and performed too with much greater regularity and evenness than could be accomplished by the hand-cards. It consists of cylinders stuck full of teeth, working contrary to each other, and of considerable size and rapidity of motion. The saw-gin, invented by Mr. Whitney, an American, is an ingenious machine, for clearing the cotton from the seeds.

scribe the fruit. 4. What of the growth of the plant? 5. How is the cotton packed? 6. How is it reduced in bulk? 7. What is said of the use of

machinery? 8. Of the working of Indian muslins? 9. What is the process of carding? 10. How is it now effected? By whom was the saw

11. The spinning of cotton was once a very tedious process; one thread at a time, by a pair of hands, could make but little progress. This spinning is also now performed by machinery, in a manner most ingenious, and, to those unaccustomed to it, very surprising. That the pliant fingers should be superseded and excelled by a pair of rollers whirled round by a steam-engine, a body of water, or any other inanimate power, seems to be an astonishing effort of art. Yet such is the case, and a thread much more thin, even, and strong, is the result. The credit of inventing this wonderful mode of operation is due to Mr., afterwards Sir Richard, Arkwright.

12. The cotton manufactory is now a very large concern. It is carried on chief-



ly in extensive buildings, and all the operations of carding, roving, spinning, &c. are carried on under one roof. Some of these manufactories contain several thousand spindles, driven either by large water-wheels, (where a fall of water can be had,) or by steam. Some of them will spin a thousand yards of warp yarn in a minute. The number of persons they employ, often taking three thousand dollars a week to pay the operators.

13. The immense advantage of skill in manufactures appears strikingly in cotton.

One pound of cotton in wool, has, by spinning it into yarn, been raised in value to five guineas; and afterwards, when woven into muslin, and ornamented with tambour, has become worth fifteen pounds: yielding a profit of almost six thousand per cent. on the raw material.

14. The greatest manufactories of cotton in the United States, are at Lowell and Waltham, in Massachusetts, Dover in New Hampshire, Pawtucket and Slatersville, in Rhode Island—but there is hardly a town in New England, possessing the requisite advantage of water, &c., which does not resound with the noise of the machinery of a cotton or woollen manufactory.

#### MUSLIN.

15. Muslins, so denominated from the downy nap upon them, which the French call *mousse*, are the finest sort of cloths made of cotton, and are the lightest, most transparent, and beautiful for female dress; though indeed in India, sometimes the men dress in long muslin draperies, which reach, like gowns and petticoats, down to the feet. There are different names of muslins; as *book muslin*, which is the clearest and most transparent sort; this is used by our ladies for a ball dress, and looks very beautiful when worn over colored silk.

16. *Jaconots* are a thicker sort of muslin, more commonly worn as a female dress. Neckcloths are also made of it. The turbans of the Indian princes are made of a great length of muslin, so fine, and so long, as to be the labor of twenty years of the weaver's life; and the criterion of the value of a dress among the ladies of the seraglio, is, its capability of being drawn through a ring. We have also *cambric mustins*, which are closer woven than *jaconots*, and have less nap upon them.

gin invented? 11. How is the spinning now performed? Who invented this species of machine-

ry? 12. What is said of the cotton manufactory? 13. Of the advantage of skill in manufactures?



## CALICOES.

17. Calicoes are so called because they were originally brought from Calicut, in Southern India. They are a thicker, closer sort of cloth, and made of a larger cotton thread. In the East Indies the calicoes are all painted by the hand, which is performed with great expedition. But in Europe and in this country, they are printed. There are two ways of doing this: one is by copper-plate, just as prints are engraved and printed; that is, the pattern is cut out in large plates of copper, by the graving tool; these lines, or grooves, are filled in with a proper ink; the surface of the plate is then cleaned, so as to leave ink only in the strokes; the cloth is then placed over this plate, and the whole is violently pressed with a roller, which forces the cloth so close to the plate, and even into the strokes, that all the ink in them comes off upon the cloth. Engraving of prints is done on the same principle; only paper, softened by wetting, is used instead of cloth; and the whole work is much finer, and more delicately done.

18. The other mode of printing is done by wooden blocks. The pattern is drawn very correctly upon a block of smooth hard wood, as box or holly; then all the parts between the actual strokes of the pattern are cut away, in deep hollows. If now the surface of the block be daubed with ink, and that surface be forcibly pressed down on the cloth, the exact print of the pattern will be transferred to the cloth; as flowers, or sprigs, or birds, just as you see them on the curtains.

19. Yet this is little more than a mere outline, and the pattern has many gay colors; these are often put in by hand, with a camel-hair pencil, as if drawing in water colors; which is easy when the outline is correctly done.

15. What of muslins? 16. Jaconots? 17. Calicoes? How are they printed? 18. 19. The other

## COTTON THREAD.

20. Cotton thread for sewing has been brought to great perfection, so as almost to supersede that made of flax. It was formerly sold in skeins, but great quantities are now disposed of already wound upon small wooden spools. These being wound by machinery are afforded about as cheap as the skeins, and save much trouble.

## CHINTZ.

21. Chintz is a fine cotton fabric; the patterns, as of all Indian goods, are peculiar and showy, though not elegant. The English have succeeded in imitating the chintz patterns; and the Swiss are very expert at these imitations.

## LINEN.

22. All linens are made either of hemp or flax. Flax is also called *lin*. The lin, or flax-plant, very much resembles the nettle, only it grows taller; and the hemp-plant is still larger and coarser. The stalks of these plants are laid in water, to soften them, that the bark may be easily stripped off. This bark is then separated lengthwise, into its distinct fibres, which fibres, in fact, become the thread, of which linen is made.

23. The chief countries in which linens are manufactured are Russia, Germany, Switzerland, Holland, Scotland and Ireland. Immense quantities of linen are exported from Ireland to England, as well as to North and South America. Russia exports vast quantities of a coarse but durable kind, called Russia duck and Ravens duck, and Russia diaper, &c. France is eminent for the delicacy of her linens; and Cambray in Wales has furnished *cambrics*, as fine as the finest sort of linen. Holland exports a linen of that name, in high esteem for its beauty, and the fineness of its fabric. The province of Zealand in

modes of printing? 20. Cotton thread? 21. Chintz? 22. Linen? 23. The chief countries in



Denmark, lying low, grows flax of a very fine and delicate texture.

24. The flax-seed is, for the most part, procured from America; but other nations engaged in this lucrative branch of trade, either raise their seed at home or procure it from the north of Europe.

25. Linen must have been in use in very early times; for when Pharaoh honored Joseph, he put on him vestures of fine linen. Egypt was famous for this commodity; the fine linen of Egypt was sought after by princes. Solomon had linen yarn brought out of Egypt, by his merchants, at a high price. Yet linen was not commonly worn by the Jews; it belonged only to the rich, and was seldom used but upon grand occasions.

26. There is no doubt but the Greeks, by their intercourse with Egypt, became acquainted with the luxury of linen. Yet we do not find any mention of its being in use among them in the early ages.

27. Neither was it common among the Romans, till late in their history. Alexander Severus, history assures us, was the first Roman Emperor who wore a shirt; he reigned in the third century. And it may be supposed that this imperial luxury was a long while in descending to the common people.

28. There is reason to believe, however, that it is to the Romans the English owe the introduction of linen into their country; both as an article of raiment, and as a manufacture; they taught the natives to plant, and prepare the flax, and showed them how to spin it into thread, and weave it into cloth.

29. The manufacture of linen in England is not on a large scale; although the Suffolk hemp is in esteem for sheeting,

and indeed for shirting; as it is said to outlast every other material, when once made up. To the English, the woollen manufacture is of far greater consequence.

30. Linen rags are yet extensively used for the manufacturing of paper. Cotton has, of late years, taken the place of linen for many purposes, on account of its greater cheapness.

31. *Buckram* is a sort of coarse cloth, made of hemp, gummed and dyed several colors. It is put into those places of the lining of a garment which are to be stiff, and intended to keep their forms.

## CHAP. XII.

### SILK, VELVETS, &c.

#### SILK.

1. For many years after silk was brought into Europe, those who brought it did not know what it was, nor how it was obtained, nor where was the original country whence it came. Its beauty, when made up into garments, induced in every one who was able to pay the price a desire to obtain it. For, coming from a great distance, and through the hands of numerous merchants, the price was exorbitant; twelve ounces of gold being demanded for a single pound of this scarce commodity. The Greeks had known silk from the time of Alexander's conquest of Persia. The Persians had supplied the Roman Empire, till the time of Justinian, in 555. This emperor, becoming indignant at the rapacity of the silk merchants, contrived, after many unsuccessful attempts, to obtain some of the silk-worm's eggs, by means of a couple of pilgrim monks, who concealed them in the hollow of their staffs. They brought over also such instructions concerning the

which linens are manufactured? 24. Whence is the flax-seed procured? 25. What is said of the early use of linen? 26. Were the Greeks acquainted with it? 27. The Romans? 28. To

whom do the English owe the introduction of the manufacture? 29. Is it on a large scale among them at present? 30. Is linen used in the making of paper? 31. What is buckram?

mode of feeding the worms, and manufacturing the produce, as enabled the Greek empire to supply itself. The rearing of silk-worms soon spread through all the countries of the Levant: Greece, Sicily, and several towns in Italy, also obtained these valuable insects, and shared in the lucrative traffic deduced from their labors.

2. The first thing we see in the process of obtaining silk, is a multitude of small eggs, which are laid by a whitish-gray moth, extremely frail, whose only existence is for this one service of laying eggs. Persons who cultivate silk, place these moths upon sheets of paper, with the edges just doubled up, as a wall to keep them in. There they deposit their eggs, which adhere, by a glutinous matter, to the paper. The eggs are now about the size of a common pin's head, and of a yellowish color. The moth lays a considerable number of them, (between two and three hundred,) and then dies, without, in this state, ever tasting food.

3. Let us return to the eggs, which are adhering in clusters to the sheets of white paper. These sheets are hung up, with the eggs inward, to a beam, in an airy room; never to a hempen line, as that is injurious to them. In a few days, they will be sufficiently dry to admit of the sheets being rolled up, with the eggs inward; in which state they may be hung up for the remainder of the year; or rather they are put into stone or glass bottles to prevent accident. They are kept in the early part of the spring considerably cool, because they must not hatch till the mulberry leaves are sufficiently forward to feed them. A little warmth is allowed them as soon as these leaves begin to bud. Presently will the eggs swell, and become pointed. Now the

rolls of paper are spread out, and hung with their backs toward the sun, to gain warmth. The eggs first change to a gray color, and in a few days become blackish. These must now be kept in a pretty warm place; and the next day, the rolled up papers will be found full of small black worms, the size of ants.

4. Their apartment must be airy, yet kept considerably warm. Broad frames placed like shelves, one above another, are provided for them; on which they are kept and fed, till they begin to spin; the room being kept all the while in a regular and comfortable degree of warmth.

5. The silk worm is a sort of caterpillar, about an inch and a half in length, of a milky or pearly color. It feeds voraciously upon the mulberry leaf, so that it cannot be reared in any country where the climate is not warm enough for the mulberry tree to grow certainly and luxuriantly. It will, indeed, eat the leaves of lettuce, but it does not thrive unless it has its own proper food. It eats night and day. The more it feeds, the faster it grows; and the faster it grows, the more silk it produces; so that its voracity is a good sign for those who rear them for profit. The Chinese feed them with fresh leaves every half hour, both day and night. If they feed fast, so as to come to maturity in twenty-four days, a sheet full of worms will produce twenty-five ounces of silk; should they be thirty or forty days in growing, they will not make above ten ounces.

6. When they begin to spin, they must have more room allowed them. They are covered with mats, to defend them from blasts of air, and to enable them to work in the dark, when they are most active, as being most at ease. The thread they spin around themselves is formed of a juice from

1. What is said of the early history of silk? 2. What is the first thing we see in the process of obtaining silk? 3. What is done with the

eggs? 4. Must their apartment be airy? 5. Describe the silk worm. 6. What must be done, when it begins to spin? 7. When have they fin-



their own bowels; something like the web of a spider.

7. In about a week they have finished their spinning, each having enclosed itself in a case, which, though formed of single threads, looks like tissue paper; it is of an egg shape, and is called a cocoon. When the silk-worm has done its part thus, it changes into a chrysalis, or aurelia; like the changed remains of our own caterpillars, which we often find adhering to the walls of houses in the country. It seems dead, and has no motion, unless you press it. In a few days, it will hatch from this state, gnaw its way through the cocoon, and come out a complete moth. In that state it will do nothing, nay it has nothing to do, but lay its eggs, for another generation of silk-worms.

8. The substance which forms the silky thread is in its stomach, in two compartments; and when it spins, it sends out a thread from each of these; which it joins together by a gummy matter, by the help of two hooks in its mouth.

9. I have said that the moth will make its way out of the cocoon in a few days after it ceases to spin. If this be suffered, the silk will be spoiled; for the hole made by the insect would divide the string of silk into so many short pieces, and render it unfit for general use. Some of them, the largest and best, may be suffered to do so, in order to have a supply of eggs for breeding in the next season.

10. Those cocoons, of which the silk is to be used, must be put into a tolerably hot oven, in baskets, in order to kill the moth inside. This will take an hour's baking to make sure of it. You will find a coarse kind of web about the outside of the cocoon, which must be carefully separated, as it is of little use.

is their spinning? When the silk-worm has done its part? 8. Where is the substance that forms the silky thread? 9. Must the moth be permitted to make its way out of the cocoon? 10, 11.

11. The cocoons are then thrown into water, at hot as the hand is able to bear, and whisked about; which will loosen the ends of the thread. Then, eight of these ends are twisted several times pretty firmly together, to unite them into one; and this thread is drawn through a hole in a plate of iron, and is fastened to the reel, which, in turning, draws forth the substance of the eight cocoons. Care must be taken if any one of them break, to join it again; or to supply its place with another, if expended. More than eight cocoons are sometimes wound together into one thread; eight suffice for ribbons; velvets require fourteen; it is difficult to unite more than thirty. The length of the thread varies much in different cocoons; some of them will measure twelve hundred ells in length, but in common they have not more than five or six hundred.

12. The refuse and coarser parts of these cocoons are carded and spun, and become useful for many purposes; it is called *flos silk*, and is made into stockings, or used for covering hats.

13. We have now obtained a thread, but two of these at least are usually twisted together, to make a thread fit for weaving. This is *thrown silk*, or *organzine*, which forms the *warp*, or lengthwise thread of the broad silk. That which crosses it is called the *tram*, or *woof*, and is more loosely twisted.

14. The great trade in silk consists of raw silk, just as it is reeled from the cocoons. Much comes from Persia and Asia Minor; the centre of which trade is Smyrna. Much comes from Sicily, and the provinces of Italy, to Lyons, which is the grand mart for silk, and the grand manufactory for silk stuffs, although it is little now to what it was once. Yet bro-

What must be done with the cocoons? 12. What becomes of the coarser parts? 13. What is meant by thrown silk? 14. Of what does the great trade in silk consist? 15. What of silk in this country?



cares, and silk goods of exquisite manufacture, still issue from their looms. Also much raw silk comes to us from China.

15. The manufacture of silk has become an object of considerable attention in this country; and the time will doubtless arrive when we shall be able to obtain excellent silk without sending for it to Europe and to Asia.

16. The term *brocade* relates to any sort of silk goods richly ornamented with flowers, wove in. Anciently, these ornaments were made with gold and silver threads. Brocaded silks were much in fashion in former days; now lighter fabrics are preferred. That sort most commonly seen is called *lustring*. This is woven over and under, like a piece of calico: the warp, and the woof or tram, appearing equally on the face of it, glistening as it catches the light. It has its name from its lustre or brilliancy. It is usually the stoutest of broad silks. *Satins*, on the contrary have the woof passing over several threads of the warp at a time, presenting a very soft and glossy surface.

17. *Velvets* have the woof thrown over a small wire. If the wire were drawn, it would show a rich arrangement of loops; but before it is removed, these loops are cut, which gives it the appearance of a rich shaggy texture, intensely deep in its color, and having a smooth and fine appearance. Florence, Genoa, and some other cities of Italy are most noted for the manufacture of velvets. At present the French velvets made at Lyons are much esteemed.

18. *Ribbons* are usually woven as narrow tustrings, but sometimes satin is intermingled, in stripes or flowers. These are called figured ribbons. The principal manufactory for these in England, is at Coventry and in France at Lyons.

19. *Saracen* is a thinner, slighter sort

of lustring woven in a similar manner though sometimes it is twilled.

20. *Modes* are something like sarcenets, but have the warp and woof of different thicknesses. *Persian* is still thinner, and more flimsy.

21. *Tiffany* is a very thin silk, having some stiffness given it. It was formerly used for trimmings, but it is now out of fashion.

22. *Gauze* is a silken fabric, quite transparent, held together by artificial stiffening. Paisley, in Scotland, is famous for this delicate material, which is used chiefly as a trimming to ornament stouter fabrics.

23. *Bombazine* is a fabric formed partly of silk and partly of worsted. This is woven at Norwich, in England. It is worthy of remark, that there has always been a difficulty in dyeing bombazine, as those coloring materials which fasten upon wool, will not lay hold permanently of silk. One man alone, a dyer in London, had the secret, by which he could make the dye strike on both at one operation. Of course, he got the whole trade in his hands, and made a fortune by it.

24. *Crape* is also made of raw silk; it is woven without crossing, and is highly stiffened with wax and gum. Having a peculiarly dull appearance, it is appropriated to mourning.

#### LACE.

25. *Lace* is a texture composed of many threads of gold, silver, silk, or thread, which are interwoven and worked on a cushion from bobbins, according to the patterns designed. Thread lace is of various kinds, denominated either from the place where it is manufactured, or from the particular method of working. That which is woven with bobbins, made of bone or ivory, is called bone-lace.

26. Bone-lace is said to have been the

16. What is brocade? Lustring? Satin? 17. Velvet? 18. What of ribbons? 19. Saracen? 20.

Modes? Persians? 21. Tiffany? 22. Gauze? 23. Bombazine? 24. Crape? 25. Lace? 26. Bone

invention of a poor woman in Germany, about the time of Queen Elizabeth. Her husband was a miner, and his business becoming slack, she endeavored to supply



family expenses by her own labor. Her ingenuity succeeded; lace became a very fashionable article of female adornment, and has continued so to the present day.

27. This has been a great manufacture, employing thousands of poor women and girls. Of late, this has been almost supplanted, by the superior neatness and cheapness of bobbinet, which is a sort of lace formed by the loom. There is a lace manufactory at Ipswich, Massachusetts, and another at Newport, Rhode Island.

28. As a matter of commerce, lace comes to us in great quantities from abroad. Mechlin, Brussels, Valenciennes, &c., in the Netherlands, still retain the excellence of their manufacture, and their reputation for it. The commodity is exquisite for its richness and fineness; and of course, it bears a high price. French lace is also of a superior quality. Much of that fine sort called *point lace*, was formerly worked in the convents, most laboriously, stitch by stitch, with the needle.

lace? 27 Bobbinet? 28. Whence is lace brought to us?

1. What are carpets? 2. 3. Where are they

## CHAP. XIII.

### CARPETS, HOSIERY, &c.

#### CARPETS.

1. Carpets are thick textures made wholly or partly of wool, and wrought in a variety of ways. Persian and Turkey carpets are most esteemed: though at Paris there is a manufactory where they make carpets little inferior to the true Persian.

2. Fine carpets are made at Axminster, Kidderminster and Wilton in England, and also at several towns in Scotland and Ireland. Excellent carpeting is exported from Brussels in Germany.

3. There are several carpet manufactories in New England, which make handsome goods. The English and Americans are the only people among whom carpets are articles of general use.

4. The carpet-weaver has his loom placed upright before him; not horizontally, as in most other cases. The warp (which means that parcel of threads which goes lengthwise) is wound round a roller at top, and another at bottom; by rolling which he can remove out of his way what has been done, and bring that part of the warp on which he is working exactly level with himself, that he may shoot the weft across it.

5. He has a pattern before him, exactly colored, and so divided by squares, answering to every ten threads, that he can see what color and how many threads of each he is to place on the spot on which he is working. He has spindles of colored yarns, of every shade he can need; these he lays conveniently for reaching, and takes up that which he wants, passing it under and over so many threads as his pattern indicates.

6. *Ruggs*, such as lie on our hearths.

made? 4. How wove? 5. Colored? 6. What of ruggs? 7. When were beaver hats introduced into England? 8. What are the materials for



are a sort of small carpet, woven with the shag very long. They are of course warm to the feet, and comfortable in winter time.

#### HATS.

7. Beaver hats are said to have been introduced into England in the reign of Queen Elizabeth. The manufacture of hats has of late years become a great object of national commerce; and the improvements made therein are considerable.

8. The materials for making hats are, rabbits' fur cut off from the skin, together with wool and beaver; to which may be added mole fur, and kid hair. These are mixed in various proportions, and of different qualities, according to the value of the hats, intended to be made. The best sorts are made chiefly of beaver.

9. A hat is neither wove nor spun, but consists of wool and hair entangled together into a sort of clothly substance called felt. The wool is cut into short lengths and mixed with the hair, by beating it with a bow. The materials are spread out, and thinned regularly, so as to adhere together enough to be handled; this is called a batt; two or more batts are placed together, and hardened, by being pressed close, and made to unite; the hairs and wool becoming closely twisted together.

10. The whole is much pressed about with the hand for a considerable time, and occasionally sprinkled with water; this operation is called basoning. It is then to be worked in hot water, having mixed with it a little sulphuric acid; in this the felt is wetted, then worked on planks; this is called soaking; some beaver hair is added in this latter operation, which being very soft and glossy, forms an outside to the felt. The hat is now something in shape like a funnel; but it is placed on a wooden block, to which it is pressed and

coaxed, till it is brought into the proper shape.

11. It is now to be dyed, which is done by boiling it in logwood, and then dipping it in a solution of copperas and vitriol. In the stiffening shop it is rendered more firm, by beer grounds and weak glue; when dry, it is brought into shape and gloss, by being moistened, brushed, and smoothed with a hot iron.

12. Hats of chip, straw or cane are made by plating and sewing the plats together; beginning with the centre of the crown, and working round till the whole is finished. Hats for the same purpose are also woven, and made of horse-hair silk, &c.

#### BONNETS.

13. The bonnets brought from Leghorn in Italy, are esteemed the finest and most valuable. Bonnets, however, are made of an excellent quality in New England, and at Dunstable there is quite a manufactory of them. The finest straws are used in the formation of them.

#### GLOVES.

14. Gloves, with respect to commerce, are distinguished into wash or tan leather, silk, thread, cotton, worsted, &c. Leathern gloves are made of chamois, kid, lamb, doe, elk, buff, &c. The leather of gloves is not tanned, properly speaking, but cured with alum, which renders it soft and pliable, and therefore more proper for gloves, &c. The Limerick gloves are manufactured in a city in Ireland from which they derive their name, and are remarkably fine. Mittens made of deer-skin, are manufactured in considerable quantities in Vermont, New Hampshire and other parts of our country.

15. The gauntlet or glove worn of old by knights in armour, was made of jointed steel plates. The throwing down of the gauntlet was the way of communicating a

making hats? 9. 10. How is a hat made?

11. How died? 12. How are straw hats made?



challenge; and if it was taken up by any one, it was a token that the combatants were to fight till one was slain, or at least desperately wounded.

#### TAPESTRY.

16. Tapestry is a kind of woven hangings, of wool, and silk, frequently raised and enriched with gold and silver, representing figures of men, beasts, landscapes, histories, &c. The art of tapestry was introduced into England in the reign of Henry VIII.; and is said to have been learned from the Saracens. At first the figures and groupes which rendered this manufacture popular, were copies of favorite paintings, but, as taste improved, and skill increased, they showed more of originality in their conceptions if not more of nature in their forms. They exhibited, in common with all other works of art, the mixed taste of the times; a grotesque union of classical and Hebrew history; of martial life and pastoral repose; of Greek gods and distinguished saints. The art of tapestry is now considerably neglected.

17. There is a famous manufactory, called *Gobelins*, near Paris, for making tapestry and other furniture. It was instituted by the brothers named *Gobelins*, who were celebrated dyers in the 15th century. They first introduced into Paris that beautiful scarlet color, which has since borne their name. The process of manufacturing tapestry is extremely slow and tedious; and it is of a price to be purchased almost exclusively by princes.

#### CHAP. XIV.

##### FURS, &c.

1. By a *fur*, we mean the skin of some animal, dressed with the hair on; when

13. What of bonnets? 14. Gloves? 15. The throwing down of a gauntlet, in ancient times? 16. Tapestry? 17. Gobelins?

the hair is taken off, it becomes *leather*. One mark of the kind attention of Providence to our wants, is the extraordinary fulness, softness, and warmth of the hairs of those animals which live in the cold Northern regions. Man soon found out, when he had killed a bear, that his skin might be made comfortable to himself. He killed him at first in his own defence, when he came to annoy him; he now seeks him for his personal convenience; finding that, by borrowing his warm fur, he can defend himself from the cold, and provide his family with a warm and soft bed to sleep on.

2. It was the usefulness of furs which brought them at first into request. Afterwards, they were thought to be proofs of valor; and every young man wanted them to evince his prowess. They were then esteemed as articles of ornament. Smaller animals were sought after; especially such as were so unfortunate as to be beautiful.

3. In the middle regions of the globe, the climate is too warm to need furs, or indeed to bear them, except as articles of finery and ostentation. The Greeks and old Romans do not seem to have worn them. But when the Northern nations, termed Goths, overran the plains of Italy, they brought with them handsome furs, and introduced the fashion of wearing them. They were, however, for a long while very scarce, and, of course, very costly.

4. For ages, the northern provinces of Asia alone supplied these articles of luxury to Europe; and still we draw many furry treasures from thence. But North America now furnishes the chief supplies; and great quantities are sent from the new world to Turkey, and even to China.

5. The most valuable skins brought

1. What of furs? 2. What first brought them into request? 3. In the middle regions of the globe—? 4. What country now furnishes the chief

from Siberia, are sables, ermines, and black foxes. The *sables* are dark, even to blackness, and so scarce, that a single skin, not broader than one's hand, will be valued at twelve or fifteen guineas. Criminals condemned to these dreary regions, and soldiers, are employed to catch these animals



in traps, or to shoot them; but in such a way as not to spoil the skin. These hunters most commonly endure great hardships in this uncertain enterprise. The woods they traverse are very large, and they have no guide to direct them out again, except the mark which they themselves make in the principal trees. Should they mistake these, they must perish.

6. Frequently they have to wait two or three days at the hole of a sable, where they have set a trap, watching in the snow till the creature chooses to come out. Often their provisions fail during their long excursions; and to prevent, or mitigate, the pains of hunger, they fasten thin boards tight round the stomach.

7. Black foxes are highly esteemed; a single skin will fetch a hundred guineas.

8. Ermines, which are delicately white, are found in all the colder parts of the North, and their skins become an important article of commerce with Norway, Lapland, Russia, &c., where they are

found in prodigious numbers. They are taken in traps, baited with flesh, and made of two flat stones, the uppermost of which, in falling, crushes them; or they are shot with blunt arrows. This animal, in warmer climates is called a *stoat*, but its fur is coarse there, and of no value.

9. In North America, there are two principal stations for the fur trade; one on the eastern side is connected with Hudson's Bay, or with Canada; and the other is on the north-west coast in the Pacific ocean.

10. The first of these was begun by Mr. Henry Hudson, who, in endeavoring to find a north-west passage to India, discovered that large inlet in North America, which, after him, bears the name of Hudson's Bay. Here he traded with the natives chiefly for skins. The trade became lucrative, and a company was formed for supporting that commerce; forts were built, and settlements made. At regular seasons, the Indians bring their stock of skins, when a sort of market is established for exchanging them for British commodities and manufactures. The profits from this trade are considerable.

11. Another distinct fur trade is carried on through Canada, and concentrates at Montreal and Quebec.

12. The most valuable skins soon became scarce, in the immediate neighborhood of the several settlements. The Indians, therefore, were excited to penetrate the most remote woods, in order to procure them; and nations the most distant were induced to bring them for sale, that they might obtain European goods, especially intoxicating spirits. Some of the early Canadian settlers adopted the hunter's life, or became trading pedlars among the natives; and embarking in canoes on

supply of furs? 5. Whence are the most valuable skins brought? 6. How are the sables taken? 7. What of black foxes? 8. Ermines? 9. What

are the two chief stations of the fur trade in North America? 10. By whom was the first of these begun? 11. What of the other trade? 12. Did



the large rivers, carried their goods to great distances, so as to be a year or more



before they returned, with the rich furs they obtained.

13. This trade was begun by the French, who were the first settlers in Canada. After the country was ceded to the English, it was long before it could be revived; as the new parties were ignorant of its course, and strange in manners and language.

14. Michilimackinac, situated at the junction of the lakes Michigan and Huron, was long the boundary of a considerable trade; it then became the centre of one much more considerable. But population has spread so much of late years, both from the British settlements and the United States, that the boundaries of their commerce are extending every year.

15. A considerable part of the fur trade of the western states concentrates at St. Louis, in Missouri. Not only the skins of beavers, otters, foxes and martens, but likewise those of buffaloes, deer, rein-deer and elks are brought for traffic to this place.

16. As the skins of beavers form one of the prime articles in this trade, an account of the method of catching them may be appropriate. It should be premised, that the beaver commonwealths are surprising instances of animal sagacity. They

live in companies of three or four hundred. Their first care is to build a dam across some valley, through which a small stream runs, to stop the waters, and form a lake, or pond. In this they build their huts, each containing one or more families, having various rooms, for dwelling and for stores. Their chief stores are branches of favorite trees, cut in small lengths. Beavers are sometimes taken in traps baited with aspen wood, but not often, for they are very cunning. The hunter's usual method is to make a hole in their dam and let the water out; this leaves the beavers on dry ground, and they are easily killed. A few are left to stock the place afresh, and the hole in the dam is carefully stopped again.

17. In winter, when the lakes are frozen, the method is to make holes in the ice around every beaver hut, over which nets are spread. The hunters then break down the hut; and the beavers instantly plunge into the water, under the ice, but as they are obliged frequently to come to the holes to breathe, they are then entangled in the nets, and taken. The hair of the skins is wrought into hats and other articles of dress.

18. Another new and lucrative trade, suggested by the memorable navigator Capt. Cook, consists in buying up the skins found about Nootka Sound, on the north-west coast of America, in high latitudes, and conveying them to China, where they are in great request, and fetch a high price: the skins and furs obtained there being far superior to those found on the Atlantic side of that continent, about Hudson's Bay.

19. Ermines and sables are used to ornament robes of high state and dignity; as those of judges, peers, &c.

20. Ladies' muffs, tippets, and trim-

the skins soon begin to grow scarce? 13. By whom was the Canada trade begun? 14. Michi-

limackinac? 15. St. Louis? 16. Beaver-skins? 17. In winter—? 18. What new trade did Capt.



mings, are beholden to the bear, the gray fox, &c. Tiger skins serve as grand saddle cloths.

21. When the hair alone is used, or used separate from the skin, the articles are not called *furs*. Yet it may not be amiss to mention, that the hair of our *cows* is of great use to the plasterer; being mingled with the mortar, it helps to bind or keep it together.

22. The long hair from *horses' tails* is woven into a peculiar sort of fabric, as a covering for chair bottoms. A principal manufacture of this article is at Worcester, in England. It is spun also into lines for the laundry, and likewise twisted into bracelets for ladies' wrists.

23. The long white silky hair of the Angora goat is a great article of commerce; the finest stuffs and camlets are made of it. Angora is a city of Natolia, in Asia Minor.

24. The hair of the camel falls off every spring, and is made into fine stuffs, for coverings of tents, and articles of furniture. The artist feels his obligation here also, as the camel-hair pencils are his great dependence, for drawing and painting in colors, especially in the smaller sized pieces.

25. The stiff hair of hogs, called bristles, is of considerable use in larger works of art. Brushes of various sorts and of considerable power are made of them; and the shoe-maker, by their assistance, gets his waxed thread easily through the hole which his awl has made. The best bristles come from Germany and Russia.

## CHAP. XV.

### FEATHERS.

1. Feathers make a considerable article of commerce, particularly those of the

goose, swan, ostrich, heron and peacock, which are used for the filling of beds writing pens, ornaments of the head, &c.

2. Goose feathers are in most common use for beds. Geese are kept in vast flocks in the fenny parts of Lincolnshire, in England. More profit is made of these by their quills and feathers, than by their flesh. They are on this account plucked, while alive, five times in the course of the summer. About the end of March their quills are pulled out, and these make the pens we write with; then their feathers are torn from them; fresh feathers grow, which are again plucked every few weeks,



until the poor birds are driven to market for sale. Many die under the operation, if the weather turns cold at the time. When they live, it is thus to suffer, and then die. Fair death seems to be less a grievance, than these repeated tortures.

### EIDER DOWN.

3. This material, so soft, is borrowed, or rather stolen, from the eider duck; a wild bird, but one that is, for the sake of its down, so kindly treated, as to be almost tame at the breeding season. They are inhabitants of Iceland and other northern countries, but are often met with in New England and Canada. All the islands west of Scotland breed numbers of these

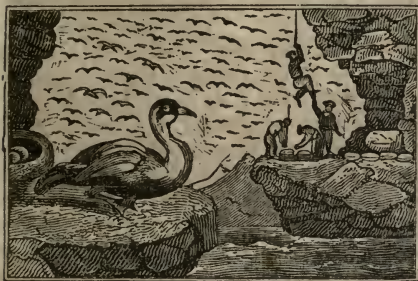
Cook suggest? 19. What of ermines and sables? 20. Muffs, tiger-skins, &c.? 21. The distinction between hair and furs? 22. Horses' hair? 23.

Angora goat? 24. Camel's hair? 25. Bristles? 1. What of feathers? 2. Geese? 3. Eider down? 4. Where do the eider ducks associate?

birds, which are a profitable branch of trade to the poor inhabitants.

4. In Greenland, Iceland, Spitzbergen, Lapland, and some of the northern districts of Norway, the eider ducks associate in vast flocks, having favorite breeding-places, usually on little islands near the shore, to which they constantly resort. Their nests are often built so close together, that a man can hardly walk among them without treading on their eggs. The inhabitants watch them, when they begin to lay, and take some of their first eggs for food.

5. Their laying and hatching continue for nearly two months. Once a week, or so, the natives visit their breeding-places,



and seize a great part of the down with which these fond creatures line their nests and cover their eggs. When the duck has torn all the down from her own breast, by replacing what had been stolen away, her partner, the drake, assists her with his. About half a pound of this down is obtained from each nest, during the season. Iceland usually exports to Denmark from 1,500 to 2,000 pounds' weight; which, as it is a very light substance, must constitute a considerable bulk.

#### OSTRICH FEATHERS.

6 It is for its plumage only that the ostrich is hunted; although its eggs are

good as articles of food. Some of the ostrich feathers are white, some black, and some gray; and they may be died of any color by the feather dressers.

7. As adornments of dress, they certainly rank high for beauty, whether they be white or black. Such as are plucked from the bird while alive are much the most valuable, as being stronger and less liable to decay. Ostrich feathers are brought to us from Africa, and particularly from the coast of Barbary. Immense quantities are bought up by the merchants of Leghorn.

8. OTHER ORNAMENTAL FEATHERS. The feathers of the peacock are in some demand as ornaments for the head. This bird surpasses in the splendor and variety of its colors, all the rest of the feathery creation. Of this he seems proudly conscious, when he struts about enjoying the bright sun. The length and the beauty of this feather require a noble and elegant figure, to bear it with propriety, as part of the head-dress.

9. There are a few feathers in the wing of the Argus pheasant, of great beauty. They do not possess a great variety of colors, for the marks are only different shades of a lightish brown, or stone color; but they appear in regular rings and spots, from end to end, in a manner which gives the idea of their being artificially produced. They form a very elegant ornament.

10. The Egret, a small sort of heron, bears on his head a very beautiful tuft of feathers. In the days of chivalry, warriors wore them on their helmets. They are now in request as ornaments for ladies' head-dresses; and the Turks and Persians wear them in their turbans. The bird was once very plentiful in England, but is now scarce; though it may be found in moist places, in all the temperate climates of the globe.

5. Their laying and hatching? 6. 7. What of ostrich-feathers? 8. Peacock? 9. Argus pheasant?

10 Egret? For what are they now in request?



## CHAP. XVI.

## PERFUMES, &amp;c.

1. Hungary water is so called from a queen of Hungary, who was cured by it of a palsy. It is distilled with spirits from rosemary. It is now principally manufactured in France, under the name of Cologne-water.

2. Lavender-water is distilled from the flowers of lavender, with spirits also.

3. Musk is one of the strongest scents in nature. It is scarcely endurable unless much diluted, and mixed with other weaker perfumes. Musk is a sort of coagulated blood, found in a bag under the belly of a creature which runs wild in the forests of Thibet, Tonquin, and Cochin China. There the animal is of the antelope or goat kind; but the species seems not to be well known to naturalists; perhaps there may be several sorts.

4. The hunters cut off the bag, and leave the creature to perish. A great many of these animals must be destroyed annually, for immense numbers of the bags come over, each about the size of a pigeon's egg. Musk is of considerable service in medicine.

5. The Civet is of the weazel kind, and carries its bag of perfume behind. It is of a milder and more pleasant fragrance than musk; the creature is wild in the warmer climates, but it will live in colder regions, if kept carefully. The Turks, Indians, Africans, and even the Dutch, keep them as articles of trade. With a wooden spoon, they scrape out this perfumed substance, every few days; and make great profit, as the demand for it is very considerable. Much of it is brought from the East Indies, about Calicut; from the coast of Guinea, and from Brazil.

## OTTAR OF ROSES

6. This fragrant perfume is the essential oil of roses. Roses are cultivated in the East Indies, in whole fields in order to obtain this precious commodity. It is found as a scum, rising upon rose-water, repeatedly and carefully distilled. So small a quantity of oil is obtained from a large field of roses, that the price has always been enormous.

7. It is said, at one time, to have been a guinea a drop; but the ottar may be obtained with less trouble than by distillation, by exposing to the sun, water, in which are steeping the petals of the rose, cleared from all the stalks and green parts. This must be covered up warm at night. When the scum rises, it may be taken off by a small piece of cotton fastened to the end of a stick; this is squeezed into some very diminutive vial, and stopped close, to preserve it from the air, until used.

## SOAP.

8. Soap is a composition of oil or fat, and potashes or any other alkali. You must remember that alkali is a substance obtained from the ashes of certain plants when burnt, or it may be obtained from some mineral bodies, particularly common salt. Alkali will unite with oil or tallow. When united the two make that hard substance called soap.

9. The greatest quantities of soap are made in Spain, Portugal, France and Italy; olive oil being in those countries most plentiful. That which is called Castile soap comes from Spain.

10. The soap met with in commerce is generally divided into two sorts, the *hard*, which is made of soda and tallow or oil, and the *soft*, which is made of potash, and the same oily matters. Soap made of tallow and soda has a whitish color, and

1. Whence did Hungary-water derive its name? 2. What is lavender water distilled from? 3. What of musk? 4. Civet? 6. 7. Ottar of roses?

8. Soap? From what substances may alkali be obtained? 9. Where are the greatest quantities of soap made? 10. Into how many sorts is the soap

is, therefore, sometimes denominated *white* soap; but it is usual for soap-makers, in order to lower the price of the article, to mix a considerable portion of rosin with the tallow; this mixture forms the common *yellow* soap of the country.

11. Soap may be easily scented with any perfume, and dyed of various colors. The soap manufactured at Windsor, in England, is in high repute. Soap improves by age.

12. There are various kinds of cosmetics and lotions for the skin, which are a considerable article of trade. But the use of these is injurious, and they sometimes turn the skin to a lead color, or even black, when mineral fumes happen to meet them. A preparation is made from bears' grease, which is efficacious in improving the growth of the hair.

## CHAP. XVII.

### CHINA, POTTERY WARE, &c.

1. The art of manufacturing China ware, as may be supposed from its name, was originally obtained from China. The commercial term for China ware is *porcelain*. This, however, is not a Chinese word, but comes to us from the Portuguese, who first brought over these beautiful wares, and with whom the word *porcellana* means a *cup*.

2. Porcelain, as distinguished from other wares formed of earth, means something fine in its texture, half-transparent, and beautiful in its colors. Pottery, stone ware, &c. are opaque; glass is extremely transparent; porcelain seems to come between the two, as partaking somewhat of both.

3. Although we call it China ware by

of commerce divided? 11. May it be easily scented? 12. What of cosmetics?

1. What of China ware, or porcelain? From what is the word porcelain derived? 2. What is

way of excellence, yet, it is said, a far superior sort is manufactured in Japan; but as the Japanese keep it all to themselves, we must take their word for it, and be content.

4. Porcelain is an article of very extensive manufacture in China. The origin of it is beyond date; as the earliest records speak of it as having always been in common use. The town of King-te-tching, where is the principal manufacture, is four or five miles long, and contains a million of inhabitants.

5. There are two substances necessary for this ware, called by the manufacturers *petuntse*, and *kaolin*. The last is a white clay, and the former a flint; both are reduced to a very fine powder, and washed repeatedly, with extreme care. These are then mixed thoroughly together; and being thrown into a large well-paved pit, the substance is well trodden, and afterwards kneaded together with the hands, with great and incessant labor; care being taken that not a single hair, nor a particle of sand, should be mingled with it; for any foreign substance would spoil the composition, and occasion cracks and warping, when the ware came to the fire.

6. This clay has then to pass through many operations to give it shape. The first workman makes it into a sort of semi-circular cup; this shape is given it by a wheel, in a moment; the next forms the base, on which the cup stands; a third, by a mould, gives it, while still soft, its exact shape. A fourth polishes it with his chisel, and reduces its thickness greatly, to help its transparency.

7. This is but a general account; for it is said that seventy workmen handle a cup before it comes to us fit for use. Some

the difference between porcelain and pottery? 3. Is it made in Japan? 4. China? 5. What two substances are necessary for the ware? 6. This clay has then to pass—? 7. How many workmen



pieces of China have large ornaments upon them; these are formed separately, and fastened on with the same kind of clay, greatly diluted.

8. When the shape is thus formed, it is given to the painters, of whom there are many. He who paints the colored circle round the brim, does nothing else; if one man traces the outlines for the flowers, it is the business of another to paint them. Supposing it to be a landscape, one paints mountains only, another trees; and the birds are not put in by the same hand which paints the human figure.

9. It is next to be glazed, or varnished; which is done with a sort of cream, made of powdered flint. When carried to the furnace for baking, each article is enclosed in a case, to keep it to its shape. The furnace is heated a day and a night, before the ware is put in, and the whole is made red hot, by the passage of the flame on every side. By this heat the flinty *petuntse* would be completely vitrified, or made transparent as glass; but the clayey *kaolin*, which is every where intermingled, being incapable of fusion, or melting, the whole together assumes the delicate appearance so much admired.

10. Porcelain is sometimes left without glazing, as in figures and ornaments; it is then called *biscuit*, and is delicately white, almost like marble. The colors used in painting porcelain are all metallic, like those used in enamelling. They are ground with gum-water, or with some essential oil.

11. All those articles which can be formed with the turning lathe, are so produced. Those which are not round in shape, are formed by pressing the prepared clay into moulds, with the hands. Figures are cast

in moulds of plaster of Paris, the clay being rendered considerably liquid by water. The mould imbibes the liquid, and leaves the figure perfect and firm. Sometimes, the different parts of a figure are cast in separate moulds, as the head, arms, &c. these are afterwards joined together with some liquid clay, and smoothed at the joinings, before they are baked.

12. In England, in many cases, the various colors in the painting are laid on separately, and each color is fixed by baking, before the next is put on. The gilding is executed by a solution of gold, mixed with quicksilver, and ground up with oil, and laid on with a camel's-hair pencil. In the oven, the gold fastens to the porcelain; and the quick-silver is evaporated. The gold at first appears dull, but is afterwards burnished.

13. The Europeans have imitated this delicate ware, and brought their manufacture to great perfection. Saxony first began; and Dresden china is in high repute. There are establishments for this ware also at Vienna, near Berlin, and at Frankendal, all in Germany. Italy has porcelain works at Florence, and Naples; even statues, half the size of life, are formed most beautifully at the former place. France has excellent china-works at Villeroy, Chantilly, Orleans, but especially at Sevres, near Paris; where elegance of shape, and beauty of colors and designs, are exhibited in great perfection.

14. At Tournay, the cups are formed differently, the clay being neither turned in the lathe, nor pressed into shape. It is made so liquid as to run into the mould, which is filled with it, and suffered to stand a little; then what has not adhered to the sides of the moulds is poured out,

are said to handle a cup before it is ready for use? 8. What of the painting of China? 9. What is next done to it? 10. What is porcelain called when left without glazing? The colors used in

painting—? 11. Those articles which can be formed with the turning lathe? 12. What is sometimes done in England? 13. Have the Europeans imitated the China ware? 14. At Tournay, how

and that which remains attached constitutes the cup. At Derby, and at Worcester, in England, there are extensive works, and very beautiful articles are made.

15. Porcelain earth is found in various parts of the United States, and will doubtless one day constitute the material of extensive manufactures. But the finer and more costly kinds of porcelain derive their value, more from the labor bestowed upon their external decoration than from the quality of the material.

#### POTTERY.

16. Pottery, or the forming of vessels of earth for the use of man, is very ancient. David says of the wicked, "they shall be dashed in pieces as a potter's vessel;" and Jeremiah broke one, as an example of divine vengeance. The Chinese annals go very far back; but the art of making pottery was known before their beginning; for their first accounts speak of it as a thing of long standing.

17. The Egyptians were famous in their day for such wares; from them the Greeks learned the art; and from the Greeks, pottery passed into Italy, to Etruria in Tuscany, and to Rome.

18. Some admirable specimens of Etruscan pottery which are preserved in the British Museum, gave Mr. Wedgwood the ambition to try to rival them in England. About the year 1763 he invented a new kind of ware, which is manufactured under the name of queen's ware or Wedgwood ware. Clay from Devonshire, and flint from the Thames, are carried, at a great expense, into Staffordshire, for its formation.

19. Mr. Wedgwood raised a village, or rather a series of villages, which he called Etruria, and which contains about ten thousand people, all of whom are employed

in these potteries. Great quantities of queen's ware are exported.

20. The delft-ware is made of clay, having a thick coat of enamel within and without. It is brittle, and now but little used. Common brown ware is made in many places; and a very neat blue and white ware is held in considerable estimation, as in some degree resembling foreign China.

21. I will now tell you about the process of making pottery. Clay alone may, by burning, be made sufficiently hard and neat for bricks: but it will not work so thin as is requisite for drinking vessels, and it would crack in the baking—therefore some tougher substance must be mingled with it. The substance found to answer best is flint, reduced to powder. This gives strength to the clay, and the whole composition when baked becomes earthenware, which is valued chiefly according to the proportions in which the ingredients are mixed together, and the care taken to have each pure and finely pulverized.

22. For this purpose the clays are dissolved in water; the mixture is well stirred about; a little time is allowed for the grit and sand to settle; then the mixture is drawn off, when the clay sinks to the bottom, and the water is easily poured away. This clay is also well beaten, to mix it, and give it a sort of tough pliancy. The flints are pounded and sifted, when the fine dust is mingled with the purified clay, in such proportions as are best for the ware intended to be made.

23. This mixture is by water made into a tough paste, sufficiently soft to be easily wrought into shape. The manner of shaping it is either by pressing it in moulds, or working it on the wheel. All round dishes, basins, ewers, &c. are formed in the way first mentioned.

are cups made? 15. Is porcelain earth found in the United States? 16. What of pottery? 17. The Egyptians—? 18. What did Mr. Wedgwood in-

vent? 19. What of Etruria? 20. Delft ware? 21, 22, 23. Describe the process of making pottery. 24. What is done with the articles when



24. When quite formed, the various articles are first dried by a gentle heat, and then thoroughly baked by a more violent fire, by which they are almost vitrified, that is, they are no longer dried clay, but almost glass. They are put into cases of the same shape, made of clay, that they may endure the fire without being warped. The vessels thus forwarded, are called biscuit; but as they have a dull appearance, they must now be glazed.

25. Common stone wares are glazed by a very simple process. When they are in the oven, a handful of salt is thrown into the fire: this instantly becomes vapor, which fixes on the biscuit, and settles in a glassy polish. But for Queen's ware, a mixture is made of water, white lead, ground flint, and pounded glass. Into this each piece is dipped; the fierceness of the fire fuses (that is, melts) the several ingredients, and the mass settles as a glass coat on the surface of each piece.

#### SPAR ORNAMENTS.

26. The hard mineral substance called spar is formed in the crevices in the sides of caverns. It is shaped into various ornaments such as vases, columns and candlesticks, which are used chiefly for our mantlepieces.

#### ALABASTER, &c.

27. This is a kind of stone resembling marble, but softer. It is of various colors, but the white shining alabaster is most common. It is used by the sculptors for the formation of small statues, vases, columns, &c. It is found in great quantities in some parts of England; and there are places in our own country where it may be obtained. Plaster of Paris is a composition of several species of gypsum dug near Montmartre, near Paris, in France, used in building and in casting busts and statues.

formed? 25. How are common stone wares glazed? 26. What of spar ornaments? 27. Alabaster? Plaster of Paris?

## CHAP. XVIII.

### GLASS WARE.

1. The first discovery of glass was made by one of those accidents, which happening to an inquisitive mind, often lead to the most important and unlooked-for results. Pliny, an ancient writer, tells us that some merchants were driven by a storm, to take shelter near the mouth of a river, in Syria, where they were obliged to continue several days. They landed, therefore, and made a fire on the sands on the edge of the shore, in order to cook their food; and they gathered the wild plants growing about, for fuel. To their great surprise, when their fire was extinguished, they discovered certain lumps, of a half-transparent substance, which glittered almost like precious stones.

2. Some persons who heard of this wonder, made inquiry as to the plants used, which they found to be what is commonly called *kali*. They tried experiments, by burning this plant; but nothing came of it; they then burned some of it with some of the sand intermingled; and soon found, they could thus form, at pleasure, the substance now called *glass*. The people of the neighboring city, Sidon, were very industrious in pursuing the discovery, and they established a manufacture for the supply of all the countries round.

3. The glass then manufactured, must have been much inferior to what is now produced; materials so coarse, and so little selected, could not furnish an elegant fabric.

4. Sand, and the ashes, or salts, of the plant *kali*, will make glass, if melted together in a fierce fire. But, in the present day, other things are added, in order to render it brilliantly clear, or to give it some beautiful color. The salts requisite are

1. How was glass discovered? 2. What were the plants used? 3. Was the glass then manufactured equal to that which is now produced?

called, from the original plant, *alkalies*. Instead of sand, which is a mixture of many stony substances, clear flint, ground to powder, is used for the finest specimens; but this is too expensive for common use. Sands, which, under the microscope, appear white, and half transparent, do well.

5. Some stones found in rivers are excellent, as are many in our gravel pits; but the white sand is in greatest repute. Manganese, lead, and nitre, are in use, as additions, but very sparingly; these tend to render the glass more clear, and colorless, if not added in too great quantities.

6. To two hundred weight of this white sand, or stones pounded small, is added rather more than half that quantity of pearl-ash, which is the alkali; this is kept in a furnace for about an hour, by which time the mass is melted and well incorporated together. The fire is then greatly increased, and continued for five hours more, by which time the mass becomes what is now denominated *fril*.

7. As, in metallurgy, many ores will not melt without something, called a *flux*, to make them flow, so, here, the crystal sand is melted by the help of the alkaline salts; and being run into one body, is ready for use.



8. If you should go into a glass-house, you would see a man who has a long tube of iron in his hand. He dips one end into

a pot of melted glass, some of which sticks to the iron tube. The glass in that state is almost liquid, and will run any way. The iron being hollow he can blow through it. He claps his mouth to the near end, and blows; his breath is dilated by the heat of the glass, and the glass swells out, like a bladder when blown into. The more it swells in size, the thinner it becomes in substance. He repeatedly rolls it, too, on a flat piece of iron, or marble, to shape and polish it. If he is going to make a goblet, he opens the end of the bladder of glass, and whirls his iron round, which makes the glass fly open into the wide shape wanted: were it a bottle, he would put the lump into a mould, and his blowing would force the glass into the exact shape of the mould. Then he would open the neck, forming it with a piece of iron, or cutting it with scissors.

9. To make window glass, which you know must be quite flat, he dips the iron tube several times into the melted glass, and blows till it becomes of a large size. He is obliged to take his work to the furnace frequently, to heat it afresh, because when it gets cool he cannot work it any longer. This globe of glass is opened, and this opening is worked wider and wider, till the glass, which was a globe, becomes quite flat—a whole circle of thin flat glass—except the knob in the middle, by which the iron rod held it.

10. At another furnace you would see them making what is called plate glass, for mirrors. Here you perceive a flat table, covered with copper, with ledges at the sides to keep it in. They pour some melted glass from the furnace upon this table. It runs all over it, up to the ledges; but in order to make it perfectly flat, and of an even thickness, the man passes a huge metal roller over it.

4. What will make glass? 5. What is said of the use of manganese, lead and nitre? 6. To two

hundred weight of this white sand—? 7. What is meant by a flux in metallurgy? 8. How is the



11. When cold, this plate of glass must be ground on both sides with sand; then polished with emery and putty, till the surfaces are extremely smooth. Yet it is not a looking-glass, till a thin coat of quicksilver is fixed on the back of it.

12. When the glass is brought to its proper shape, it must undergo another process before it is fit for use; this is called annealing. The pieces of ware must be brought so near the fire, as to be almost in a melting state; they must be drawn away in a very gradual manner, so as to cool gently; else they would be so brittle as not to bear hot water; and they would break too with the slightest stroke.

13. The silvering of the plate glass for mirrors is not done at the glass-house; but as I suppose you are curious to know how quicksilver can be fastened upon glass, I will tell you. It is called silvering the glass; although, in fact, it is tinning the glass; for it is a sheet of tin foil which is fastened upon the glass by the help of quicksilver, which dissolves and mingles with the tin foil, and thus adheres. Tin foil is pure tin, beaten out to a very thin leaf. This must be the whole size of the glass. The foil is laid on a very flat smooth stone table; quicksilver is poured on this, till it is floated with it; the glass is then placed on it, and pressed down with leaden weights. It remains thus for several days, till the mixture cleaves firmly to the glass.

14. You would perhaps like to know about the cutting of glass. You see many wine glasses and decanters have formed on them beautiful shapes, knobs and angles, which glitter and show a variety of colors; now this is done by grinding. Glass, to be cut, is held against a sharp

wheel, which revolves swiftly; and the workman by moving the glass produces the different designs—squares, triangles, diamonds &c.—which you see upon it.

15. The Venetians were long preeminent in the art of making glass, both as to purity and magnitude. During the thirteenth century, they were the only people who were able to fabricate mirrors of a large size, fit for the decoration of splendid apartments. All the European courts were obliged to buy of them, not only looking-glasses, but all the better sort of glass vessels, as well for use as elegance.

16. This manufacture was too important, and too profitable, to be suffered long to remain exclusively in the hands of one nation, especially when the use of glass for windows had been thoroughly introduced. This convenience first appeared in England in 674, when the monastery of Weremouth was glazed. But the first manufacture of the kind was in 1557, when fine flint glass was produced. Excellent glass is now manufactured in different parts of the United States.

17. Glass, for windows, and for glazing prints, called *Crown-glass*, is an article of great use. For a long season, all this kind of glass, made in England, had a greenish tint; till one person, who had his manufactory in London, was able to produce it clear, and he made a great fortune. You may suppose his method was of some importance, since he was offered more than seventeen thousand dollars for the secret. He, however, wanted twenty thousand; and because he could not get that price, his secret died with him.

18. Glass may be colored by the addition of various substances, chiefly oxydes, or rust of metals. Glass of a very fine

glass blown? 9. Window glass made? 10. Plate glass? 11. Is it polished? 12. Describe the process of annealing. 13. How is the quicksilver fastened to the glass? 14. What is meant by cut

glass? 15. Were the Venetians famed for the art of making glass? 16. When was it introduced into England? 17. What is meant by crown glass? 18. May glass be colored? What is *paste*?

and hard texture, & colored, so well as to represent most of the more precious gems. When quite clear from color, it is called *paste*, and was once much in fashion, as producing a brilliancy nearly equal to that of diamonds. The French are fond of it still.

## CHAP. XIX.

### IVORY, JEWELRY, &c.

#### IVORY.

1. Ivory is a hard, solid and firm substance, of a white color, and capable of a very good polish. It is the tusk of the elephant, and is hollow from the base to a certain height, the cavity being filled up with a compact substance, similar to marrow. The Ceylon ivory, and that of the island of Achem, do not become yellow in the wearing, as all other ivory does. For this reason the teeth of those places bear a higher price than those of the coast of Guinea.

2. Ivory is usually brought to us from the coasts of Africa, where elephants abound. The elephants' teeth of Asia are not more than three or four feet in length; but those of Africa, especially such as are procured from Bombaza, and Mozambique, are seldom less than ten feet long, and are so heavy, that two men can with difficulty carry one of them.

3. Ivory, among the wholesale dealers in the article, is divided into elephants' teeth, properly so called, and *schrivelli*, or *schrivellos*, which last consist of the smallest teeth and fragments.

4. The uses to which ivory is put are various. It is employed in the manufacture of ornamental articles, mathematical instruments, cases, boxes, balls, combs, dice, and a variety of toys.

#### TORTOISE SHELL.

5. There are two general kinds of tortoises, namely, the land and sea tortoise. It is a species of the latter class, and a native of the tropical seas, which furnishes the beautiful shell so much admired. This shell is used in inlaying, and in the manufacture of combs, boxes, and a great variety of other articles.

6. The best tortoise-shell is obtained on the shores of the Spice Islands and New Guinea, although much of it is brought from the West Indies. The goodness of tortoise-shell depends mainly on the thickness and size of the scales, and in a smaller degree on the clearness and brilliancy of the colors.

#### HORN.

7. Horn is a hard substance, growing on the heads of animals, particularly the cloven-footed quadrupeds. When in thin plates, horn is quite transparent, and has sometimes been substituted for glass in windows. When heated sufficiently, it becomes very soft and flexible, so that its shape may be easily altered. Hence it may be gradually squeezed into a mould and wrought into various forms.

8. Horns make a considerable article in the arts and manufactures. Bullocks' horns, softened by the fire, serve to make lanterns, combs, handles for knives, and numerous other useful things. Horns may be died of various colors, and stained by sort of paste, so as to bear a great resemblance to tortoise-shell.

#### COMBS.

9. Combs are generally made of horns of bullocks, of tortoise-shell, or of ivory. Some are made of sea horses' teeth, and others of box or holly woods.

10. Bullocks' horns are thus prepared for the manufacture of combs. The tips

1. What can you say of ivory? 2. Whence is ivory usually brought to us? 3. Into what is ivory divided, among wholesale dealers? 4. To what

uses is ivory put? 5. What of tortoise shell? 6. Whence is the best obtained? 7. What is horn? 8. For what is it used? 9. Of what are



are first sawed off; they are then held in the flame of a wood fire: this is called roasting, by which they become nearly as soft as leather. While in this state they are slit open on one side, and pressed in a machine between two iron plates. They are then plunged into some water, from which they are taken out hard and flat. The comb-maker next saws them into lengths according to the sized combs he wants. To cut the teeth, each piece is fixed in a tool called a clam. The teeth are cut with a fine saw, or rather a pair of saws, and they are finished with a file.

11. The process used for making ivory combs is nearly the same as that already described, except that the ivory is first sawed into thin slices.

#### JEWELRY.

12. Jewelry, properly speaking, is the preparing of jewels; but as they require gold and silver for setting, so all ornamental work in silver and gold has the name of jewelry, although there may be no use made of precious stones.

#### WATCHES.

13. The making of watches is often, a considerable part of a jeweller's business. The town of Geneva in Switzerland is very celebrated for this manufacture, but it is extensive all over Europe. The Lepine watches of Paris, made by one firm in that city, are quite famous. Many thousands of them are annually sold.

14. A striking watch is one which besides the common watch-work for measuring time, has a clock part for striking the hours, so that, properly speaking, it is a pocket-clock.

15. A repeating watch is one that by only pulling a string, touching a spring, &c., repeats the hour, half-hour, or quarter, at any time of the day or night.

combs generally made? 10. 11. How are the horns prepared? 12. What is meant by jewelry? 13. What of watches? 14. A *striking* watch?

#### CLOCKS.

16. The measuring of time with wheel-work was not known in ancient times. We owe the invention of clocks to the monks of the middle ages. In the 12th century, clocks were made use of in the monasteries, to announce the end of every hour by the sound of a bell, put in motion by means of wheels. From this time forward, the expression "the clock has struck" is often met with. The elegant Parisian pendulum-clocks are well known, in which the art of the sculptor is combined with that of the machinist.

17. Wooden clocks are made in great quantities in a part of South Germany called the Black Forest. It is said that 70,000 of such clocks are made there annually. Great numbers of wooden clocks are also made in Connecticut, and sold by pedlars through different parts of the country. The character of some of these itinerant vendors has often brought the article into disrepute.

#### MOSAICS, &c.

18. It would be useless to enumerate the great variety of articles, which are displayed in a jeweller's shop. Some of them will more properly come under our succeeding chapter. Rings, ear-rings, and breastpins are ornaments too familiar to need a description. Some of these are inlaid with mosaic-work, and others with precious stones. In mosaic-work, figures are composed, joined, and cemented together of various colored stones, or glass imitations. The ancients practised this art with much skill and exactness.

#### AMBER.

19. This is a transparent, and very hard inflammable substance, of a bituminous taste, very fragrant smell, and highly electric. Its natural color is a fine pale yellow.

15. A repeating watch? 16. Clocks? 17. Wooden clocks? 18. What of mosaics? 19. Amber? 20. Coral? 21. Where is coral found? 22. How

low, but it is often made white and sometimes black. Amber is principally to be met with on the sea-coasts of Prussia. The river Giaretta in Sicily, which takes its rise on the north side of Mount Etna, throws up near its mouth great quantities of fine amber. Some pieces contain flies and other insects curiously preserved. Amber is sometimes used in medicine, but it is chiefly manufactured into beads, crosses, and other ornaments.

#### CORAL.

20. Coral is a marine production, of which there are several varieties. It is in fact the nest of a certain species of insects, which has the same relation to coral, that a snail has to its shell. The white coral is the most common, and the least prized. As an ornament, black coral is most esteemed; but the red is also quite valuable.

21. Coral is found in great abundance in the Red Sea, the Persian Gulf, in various places in the Mediterranean, on the coast of Sumatra, &c. The red coral, most in use among us, is fished up in the Mediterranean, on the coast of France. This is used principally in making beads for necklaces and other ornamental appendages.

22. It is obtained in the following manner. The boats go out with seven men in each; six of them manage the boat, and the seventh is the fisher. They let down a large cross of wood, furnished with hempen loops, and hooks; when it seems to be sufficiently entangled among the coral-beds, the boatmen row away, and endeavor to tear it up. Sometimes it is more than one boatful of men can do; five or six boats must join. And sometimes, when the coral snaps unexpectedly, the jerk oversets the boat, and precipitates the men into the sea, at the hazard of their lives.

23. Although the insects, which produce coral, seem too diminutive to be of any importance, yet they are effecting results of startling magnitude in the South Seas. Almost all the islands there are the tops of coral reefs, which have been raised by these little creatures. The growing mass as it spreads its branches outwards, becomes hard, and uninhabitable in its inner recesses. In the course of time, these coral rocks rise above the water, and grow no higher, for the animal cannot live out of the sea. Weeds, branches and sea plants then help to form the remainder of the island.

### CHAP. XX.

#### PEARLS AND PRECIOUS STONES.

##### PEARLS.

1. Pearls are hard, white, shining bodies, usually round, obtained from various kinds of shellfish. Although highly valued in the rank of gems, pearls are supposed to proceed only from a distemper in the creature that produces them.

2. The pearl fisheries in Europe are not of much importance. Pearls are found occasionally on the coasts of Scotland, Bohemia, Bavaria, and a few other places. These are not prized like the Oriental pearls, though they make good necklaces, even to the value of a thousand crowns.

3. In America there are pearl fisheries, in the Gulf of Mexico, and all along the coast towards Brazil. The island of Margarita has its name on this account; Margarita signifying a *pearl*, through the languages of the Latins, Greeks, upwards to the Hebrews. On the other side of the isthmus of Darien also, at the Gallipagos Isles, the fishery is considerable.

4. But as the finest and most valuable

as it obtained? 23. What is said of the formation of some of the South Sea Islands?

1. What of pearls? 2. The pearl-fisheries of Europe? 3. America? 4. Whence are the most



pearls come from India, it is most to our purpose to describe that fishery which takes place on the coast of Ceylon. Although, on the Arabian coast, and in the Gulf of Ormuz, many are obtained.

5. Ceylon is a large island in the Indian ocean, adjacent to the southern point of Hindoostan. The banks where the fish abound, lie about twenty miles off at sea, opposite the Bay of Condatchy. The government does not allow the whole bank to be fished in any one season; it is divided into four portions, one of which suffices for a year; thus, as the fishers make progress through the whole, each bank obtains time to recover the devastations made in it. The right of fishing this bank is put up to sale, and is usually bought by some black merchants.

6. The fishing begins in February, and is continued through the month of March. In stormy days the divers cannot proceed. The boats set off at the signal of a gun, about ten o'clock in the evening, when the land breeze is in their favor; they reach the banks about break of day; and about noon the sea breeze rises, with which they return to land.

7. Each boat carries about twenty men; half of whom are to row, and assist the divers, especially in coming up, when they are considerably exhausted. Of the other ten, who are divers, five go down at a time; one company resting, while the other dives. They have a large stone tied to their foot, of forty or fifty pounds' weight, to enable them to sink; this has a line fastened to it, that it may be drawn up, and serve again.

8. The diver, when about to descend, seizes the rope between the toes of his right foot, for by custom he can use his toes as well as his fingers; and he holds a

bag of net with his left foot. He takes hold of another rope with his right hand, and holds his nostrils with his left. He then plunges into the sea, holding his breath; he hangs the net round his neck, and, as quickly as possible, fills it with as many oysters as he can gather up in about two minutes. By jerking the rope, he gives notice to those above to draw him up; and loosing the stone from his foot, he rises quickly into the air. They seldom get deeper than thirty yards, which is indeed a great depth.

9. When in the boat again, the violence of the operation appears, by his discharging water, and sometimes blood, from his mouth, ears, and nose. He then rests, while the other five descend. Each man will thus go to the bottom forty or fifty times in one day, bringing up possibly a hundred oysters at every turn. They are the poorest wretches who labor in this dangerous way; they live but a few years, for they are liable to the bursting of blood vessels, drowning, being devoured by sharks, or death from deep consumption.

10. When the boats return to land, the oysters are heaped in pits, lined with mats, to prevent the oysters from coming in contact with the earth itself. They could not be opened while alive without great force; but when they begin to putrify they open, and are taken out without injury.

11. The formation of these beautiful gems of the ocean, is among the wonders of nature. The oyster itself lines its own shell with a pearly matter, oozing from glands in its body, provided for this purpose. Perhaps this liquor may be generated in too great quantity, and may burst in drops, into the cavity of the shell. There is reason too to think, that the creature is sometimes wounded, and that this

valuable pearls brought? 5. Where is Ceylon? What is said of the banks where the fish abound? 5. When does the fishing begin? 7. How is it

continued? 8 How does the diver obtain the pearls? 9. Is the occupation a dangerous one? 10. What is done with the oysters? 11. What is

matter flows from the wound; especially, as smooth and perfect shells are not so likely to have pearls in them as those which are deformed and distorted, or crooked.

12. Pearls should be of a clear white, and highly glistening; this lustre is called their water. In the East, those which are tinged with a little yellow are preferred; especially as they are thought never to change their color. The white are apt to degenerate to a very dingy yellow, after forty or fifty years' wearing.

13. The black natives paint them with powder of pearls; and drill them with great dexterity, that they may be strung ready for use.

14. Pearls are valued according to the square of their weight. If a pearl of one carat be worth ten shillings, a pearl of six carats will be worth thirty-six times as much, or eighteen pounds; for the square of six, that is the number multiplied by itself, is thirty-six.

15. The ignorant are often deceived by buying, as genuine productions of nature, articles which are mere fabrications, or *artificial pearls*. Some pretend to unite several small pearls into one large one, which is impossible. From the scales of some fish a silvery matter may be obtained; this is dropped into a hollow bead of very thin glass; and the appearance is so nearly that of the real pearl, that none but a practised eye can distinguish the difference. Nay, a thin skin from the eye of the mackerel, may be stamped into a half-globular shape, which, when set, will deceive the careless and inattentive, into the conceit of a great bargain.

16. Seeing the dangers of the pearl fishery are so great, one may be allowed to wish, that the better sort of artificial pearls

might content our fair ladies; as the whitest of the real pearls, morally viewed, are stained with blood.

#### MOTHER OF PEARL.

17. What is called *mother of pearl*, is the inner lining of a shell, not of the pearl-oyster, but of another species; this is of the same substance as the pearl. It is very beautiful, and is made up into many trinkets, or used with great advantage to inlay the nicer sorts of cabinet-work. Fishes and counters, for card-players, are formed of it. Its neat and beautiful appearance makes it suitable for various small ornaments. The principal manufacture of this material is in Jerusalem; vast quantities of it are brought thither from the Red Sea; it is formed into wafer-boxes, crucifixes, &c., which, when exported to the Spanish West Indies, are highly prized, and bring an immense profit. There is also a manufactory of Pearl work, as it is called at Boston, which has supplied the United States with most of these articles for two or three years.

#### DIAMONDS.

18. The diamond is a most precious stone, which has been known from the remotest ages. When pure, it is perfectly transparent like crystal, but much more brilliant. Indeed, it has been said that the excellency of a diamond is greatest, when you cannot see it. For, if you consider a little, it is not the diamond itself that you see, but the light reflected by it.

19. The *first water* in diamonds, means the greatest purity and perfection of their complexion, which should be that of the purest water. When diamonds fall short of this perfection, they are said to be of the second or third water &c. If you were to see a diamond in its rough state, before it is polished, you would not suspect it to

said of the formation of the pearls? 12. How should pearls be? 13. The black natives? 14. How are pearls valued? 15. What of artificial

pearls? 16. Viewing the pearl-fishery in a moral point of view, what is the conclusion? 17. What of mother of pearl? 18. What of the diamond?



be any thing but a common stone; unless you were accustomed to it. When unpolished, diamonds have a whitish-gray appearance, and are destitute of brilliancy.

20. A poor woman at Norwich, in England, once had a Jew rap at her door, to ask her if she would part with a stone, which lay in her window. She said, No, it was a keepsake from her son Ben, who was gone to the Indies. The Jew, instead of being daunted, was stimulated, by this account, and said he had taken a fancy to it, and would give her a crown for it. The woman was shrewd enough to know, that a Jew would not give five shillings for any thing unless it were worth a great deal more. She therefore refused to part with it obstinately, till she had found out what it was, and what was its real value. In the sequel, it was discovered that this stone was a very large diamond, in its rough state, for which she procured a thousand guineas or about five thousand dollars; after it had thus lain in her window for years, as a common stone.

21. I can tell you another story too, which may serve to make you careful, in things which might not at the time seem to be of any importance. Some fifty years ago, an East-Indiaman was wrecked near Aldborough, on the coast of England. A few weeks afterwards, some gentlemen came down in a post-chaise, inquiring for any remnants of the wreck; especially for some small, but strong, boxes. At last, they found a laboring man had got one of the boxes, which they might have if they liked. It had taken him, he said, a plaguy deal of time to break it open, and when he had done so, there was nothing in it but a parcel of ugly stones. The gentlemen eagerly inquired what he had done with them. Oh, he said, they were good for

nothing, and he had *hulled* them away into the field.

22. They made him point to the place as nearly as he could, and were at the expense of having the whole field sifted and searched, but almost to no purpose; as very few of the diamonds (for such were these stones in reality) were recovered. Had he been a little wiser, he would have supposed, that those could not be common stones which were packed up so carefully, in strong iron-bound boxes. As it was, he had the punishment of knowing, that he had thus missed of a handsome reward through his ignorance, and his want of common honesty, which ought to have induced him to wait to see if any one came to claim the boxes.

23. The diamond has always been in request, from its scarcity, as well as its beauty. The ancients called it *adamant*; which word is still in use to express any thing extremely hard. The diamond is the hardest substance in nature; nothing but itself can cut it.

24. To get the diamond into a proper shape for showing its brilliancy to advantage, the lapidary rubs two of them together, and they wear away each other. The very dust so made is also carefully saved, as nothing else will polish this excessively hard stone.

25. There is a diamond mill at Amsterdam, which is an interesting object. The process of polishing the diamonds is as follows: Four horses turn a wheel, setting in motion, in the room above, a number of smaller wheels, whose cogs, acting on circular metal plates, keep them in continued revolution. Pulverized diamond is placed on these; and the stone to be polished, being fastened at the end of a piece of wood by means of a preparation of zinc

19. What is meant by the *first water* in diamonds? 20. Relate the story of the poor woman and the Jew. 21. 22. What is the other story? 23. What

name did the ancients give to the diamond? 24. How are diamonds shaped? 25. Describe the diamond mill at Amsterdam. 26. What country

and quicksilver, is submitted to the friction of the adamantine particles. This is the only mode of acting on diamond; which can be ground, and even cut by particles of the same substance. In the latter operation, diamond dust is fixed on a metal wire that is moved rapidly backwards and forwards over the stone to be cut. The distinction between a rose diamond and a brilliant, is this. The one is entire and set vertically, the other is divided, and set horizontally. The largest diamonds are reserved for roses, which always rise in the centre to an angle; the smaller are used as brilliants, and are flat on the upper surface.

26. The main source of supply, for ages, has been the East Indies. There we still find four principal mines, or rather two mines in which they are digged, and two rivers, by which the diamonds are washed down from the bowels of the mountains.

27. In Golconda on the Eastern coast of Hindostan, it is common for the merchants, who are often blacks, to buy a certain portion of land, in which their slaves dig for diamonds. Sometimes they find nothing; at other times they obtain great wealth in a single season.

28. The diamond mine at Raolconda, in this province, has been resorted to for this purpose full two hundred years. The soil is sandy, and the rocks are full of clefts. In these clefts, though not above an inch wide, the miners search with hooked tools, dragging the sand all out. This they wash carefully, to search for the stones. The people work naked, (except one narrow piece of cloth,) that they may not be able to secrete any for themselves. They do, however, now and then succeed in swallowing some, and thus bring them away without being discovered.

29. There is another mine at Gani, also in the province of Golconda. This was discovered about a hundred and fifty years since, by a peasant, who, in digging, found a large one. Here the Great Mogul's famous diamond was found, weighing almost eight hundred carats; in general, they do not weigh above ten or twenty. A carat is a weight used only for gold, diamonds, pearls, and similar precious commodities; about one hundred and fifty carats make an ounce, in the troy weight.

30. In this mine there are often sixty thousand poor wretches obliged to dig. The manner is thus: near the place where they hope to find diamonds, they dig a pit, which they enclose with low walls; they then dig in the spot they have chosen, till they find water; and they stir up the earth well with this water, which is afterwards let off. What the men have dug and washed, is carried by the women and children into the first pit; there they wash the earth they have obtained, and dry it, and sift it; and then adroitly search with their hands for the diamonds, which they learn to know by the feel. This mine is on a plain, at the foot of the mountains; the nearer the mountains they can dig, the larger are the diamonds they find. All this work, laborious as it is, is made a kind of holyday, by the feast given previously, and the superstitious rites and sacrifices, supposed to make the genii of the place propitious to them.

31. The river Goual runs into the Ganges, in the northern part of India. After the great rains, which have flooded all the country, have subsided, the natives of the neighborhood, to the number of ten thousand, assemble; they gather up the sands of the river, digging it about two feet deep, where, by experience, they see reason to expect diamonds. This they wash dry,

has furnished the chief supply of diamonds? 27. In Golconda- 28. What of the diamond-mine

at Raolconda? 29. Gani? What is a carat? 30. What is the manner of digging? 31. What is



sift, and search, as before. The stones they thus obtain are small, and are called *sparks*.

32. There is another diamond-mine in a river, in the island of Borneo. This is secluded from strangers, so that we know little about it; except that by stealth, diamonds are brought from thence and sold at Batavia.

33. Diamonds are also found near Villa Rica and in other parts of Brazil. They are so plentiful, that to prevent the price of diamonds from becoming too low, the government limits the number of persons employed in the mines. The sand is washed in a manner somewhat similar to



that described above. After the current flows away quite clear, the largest stones are thrown out and then those of inferior size: then the whole is examined with great care for diamonds.

34. The value of diamonds is artificial, yet, while they are in request, and can be turned into money, the value is truly real. But the usual mode of valuation makes the larger sort rise in price, much beyond their increase in size and weight; till, for some few, the valuation is enormous.

35. The largest diamond on record was found in Brazil. An ignorant man, by a violent blow of a hammer, split off a large piece; but it now weighs one thousand

six hundred and eighty carats. It however remains uncut, because the cost of polishing it would be so great.

36. The Emperor of Russia has one next in size, which may well be esteemed a famous one. It was once the eye of an idol, in the East Indies. A French soldier, who deserted his regiment, contrived to become a priest to this idol, and took his opportunity to steal the idol's eye out of its socket! He then escaped to Madras where he sold it to a sea-captain, for twenty thousand rupees, or about two thousand pounds. A Jew then purchased it for seventeen thousand guineas. A Greek merchant obtained it next; who sold it at Amsterdam, to Prince Orloff, through whom it came to the Empress Catherine, who placed it in her sceptre. It weighs seven hundred and seventy-nine carats. It cost above one hundred and thirty-six thousand pounds, and is valued at four millions.

37. To ascertain whether any specimen is a true diamond or not, a fine file may be used; and if the surface of the stone be the least scratched by its action, it is not a diamond. Brazil now furnishes the greatest number of diamonds to the world.

#### CORNELIAN.

38. The cornelian is a precious stone, of which there are three kinds, a red, a yellow and a white. It is found in round or oval lumps, much like our common pebbles. It is tolerably hard, and susceptible of a very fine polish. It is used principally by jewellers in the manufacture of beads, watch-seals, &c. The finest cornelians are those of the East Indies; but very good ones are found in some parts of Germany as well as of Great Britain.

#### EMERALD.

39. Emerald is a precious stone of a beautiful green color of various depths. The purest specimens come from the East

said of the river Goual? 32. The diamond-mine of Borneo? 33. Brazil diamonds? 34. The value

of diamonds? 35. What is the largest diamond on record? 36. Who has the one next in size?

Indies and Peru. It is of different sizes, but usually small. Crystal tinged with green is very often substituted for the inferior sort of emeralds.

#### JASPER.

40. This stone, which is usually found in the East Indies and China, is an ingredient in the composition of many mountains. Its colors are various, and often mingled together. It is mostly employed by jewellers in the formation of seals, and when well polished is a very beautiful stone.

#### RUBY.

41. The ruby is a precious stone very highly esteemed when pure. But under this name minerals have sometimes been sold, which are essentially different. The oriental ruby is, in fact, a red variety of the sapphire. When perfect, its color is a deep red, presenting an exquisite richness of hue. It is, however, in general, more or less pale, and often mixed with blue. It is harder than any mineral, except the diamond. Rubies are found in Pegu, the island of Ceylon, and Brazil.

#### SAPPHIRE.

42. Sapphire is a precious stone, usually of a blue color, and the hardest of all, except the ruby and diamond. It is found in the same countries with the ruby, and also in Siberia and some parts of Europe. Sapphire is found of a gray, white, green and yellow color, and usually of the form of common pebbles.

#### AMETHYST.

43. The amethyst is a gem of a purple color, and is scarcely inferior to any of the gems in beauty and hardness. It is found of various sizes, and the best come from the East Indies. It is also met with in the West Indies, and in different parts of Europe.

#### TOPAZ.

44. The word topaz, derived from an island in the Red Sea, where the ancients used to find topazes, was applied by them to a mineral very different from ours. The topaz is found in several parts of the East Indies, in Ethiopia, Arabia, Peru and some parts of Europe. The colors are various, and it often occurs, red, blue, green, yellow and white.

#### AGATES.

45. The agate is a gem, which takes its name from the river Achates in Sicily, on the banks of which it is found. It is variegated with veins and clouds, and seems to be composed of crystal, colored by a large quantity of earth. Its colors are yellowish, reddish, bluish, orange, green, &c. Agates are found in Great Britain, and many parts of America. The German agates are the largest. Some very fine ones have been brought from Siberia and Ceylon. They are found in great plenty at the eastern extremity of the settlement of the Cape of Good Hope, and are still met with in Italy.

#### JET.

46. Jet is a black, inflammable and bituminous substance, which is susceptible of a fine polish. It occurs in France, Spain and many other parts of Europe, and is found at South Hadley, in Massachusetts, in the coal formation. Jet is chiefly converted into beads, bracelets, buttons, and other small ornaments. In Prussia it is called black amber, and is cut into rosaries and necklaces.

### CHAP. XXI.

#### PRECIOUS METALS.

##### GOLD.

1. Gold has always been a metal highly prized; partly for its scarcity, partly for

38. What of cornelian? 39. Emerald? 40. Jasper? 41. Ruby? 42. Sapphire? 43. Amethyst?

44. Topaz? 45. Agates? Whence is the word *Agates* derived? 46. What of jet?



its brilliancy, and much on account of its durability. It is not liable to rust, evaporation, or to any destruction of its essential substance. If, indeed, any metal were to be prized for its usefulness, iron would deserve man's highest esteem. Many nations have been happy without gold; but no comforts or conveniences, no arts or sciences, could be attained, or prosecuted, without iron.

2. We read of gold in Scripture, in very early days. In the description of Paradise, one of the four rivers flowing out of it encompassed, we are told, the 'land of Havilah, where there is gold,' (*Genesis*, ii. 11.) A chain of gold was put upon the neck of Joseph, at his exaltation. It became so plentiful, and was esteemed so highly, that Israel in the wilderness was cautioned against making gods of gold, to worship them.

3. Gold seems to be very generally found, though Europe has been less favored with it than other parts of the earth. Asia has been rich in this precious metal; the river Pactolus, in Lydia, yielded much to king Cæsar; and to this day Sumatra, Pegu, China, and Japan, yield considerable quantities. In Europe, though gold mines have been found in many places, yet the principal one now worked is that of Chrennitz, in Hungary, which has yielded gold for a thousand years. Spain once afforded much to the Romans; but the mines are not now worth working.

4. Africa yields gold in considerable quantities, chiefly in small grains, called gold-dust. In Solomon's time, Ophir, on the eastern coast, was famous for it. But since the discovery of America, the greatest supply has been obtained from thence; from Mexico, in the Northern Continent; and from Chile, Peru, and Brazil, in South America; and more recently from North

Carolina, Georgia and other parts of the United States.

5. Gold is sometimes found in mines, but it must be digged for. It is also found more frequently in particular rivers, mingled with the sands. These sands are sifted and washed. Those employed in searching for them, have a long trough, which they place sloping; this is lined at the bottom with flannel; and the sand put into this is well mingled with water and kept stirring. The gold by its weight sinks, and is entangled in the flannel; but the water and sand pass away. The gold, thus separated, is easily melted into a lump, or ingot.

6. In Guinea, the gold is chiefly found in the sand and mud of rivers. Between two and three thousand ounces of gold-dust annually come from thence; and several hundred ounces from the Gambia. Much is brought from the interior, into Egypt, in this form, secured in the hollows of ostrich quills.

7. In the streams which drain from the mountains of Chile, a peculiar sort of gold is found, and it is separated from the earth in which it is imbedded by washing, at places called *lavaderos*. When the natives have discovered a place proper, they dig about six feet deep; and endeavor to turn some rivulet into the pit, to wash away the upper soil, and lay bare the stratum of golden earth. They then dig, load their mules with the earth, and carry it to be washed.

8. In Brazil, the invading soldiery of the Spaniards perceived that the fish-hooks of the Indians were made of gold. On inquiring, they found this was obtained from the sands of the rivers, after violent floods; since then, gold has been sought for with great care, and is found almost in every stream.

1. What is said of gold? 2. Do we read of gold in Scripture? 3. 4. In what countries is gold

found? 5. How is it obtained? 6. Where is it found in Guinea? 7. Chile? 8. What did the

9. Gold found in mines is sometimes in small lumps; seldom any piece weighs more than an ounce, although pieces have been found of thirty-six ounces, and even of several pounds' weight. Some pieces of this sort were sent to Spain, by Columbus, to convince the court of the treasures likely to be obtained in his newly-discovered world.

10. In other places, gold is found in a sort of stony lump, or clods, which usually lie at great depths in the mine. These lumps are very hard, and generally contain silver, or some other metal, mingled with the gold. The precious substance is found but in small quantities; five thousand pounds' weight of the mineral yielding only a few ounces of gold.

11. Native gold is not usually found, except deep in primitive mountains, and in the crevices of rocks.

12. The obtaining of gold from the ore, is a troublesome and an expensive operation. They first break the stone with heavy iron mallets; then they grind it in a mill, and sift it through many sieves, the latter sort finer than those used at first. This fine powder is soaked in salt and water, in open troughs. They then squeeze among it, in a sort of dew, some quicksilver, which having an amazing affinity for gold, seizes on it, and intermingles, or amalgamates, with it in a short time. All the earthy matter, and the salt, are easily washed away with hot water; so that nothing remains but this metallic mixture. The mercury is then driven away by heat, and the pure or virgin gold remains. It is then melted, and cast into ingots.

13. In some places, they lay sheepskins, with the wool on, in the waters where they expect to find gold; and the grains

of gold are entangled in the wool, while the earthy parts are washed away.

14. The gold mines in the United States are annually proving a source of considerable profit to the proprietors. These mines abound chiefly in the Carolinas and Georgia. The most lucrative diggings in North Carolina have been made in the



counties of Mecklenburg and Cabarras. In the latter county, a single lump of gold was found weighing twenty-eight pounds. A part of this gold is sent to Europe; and a considerable portion of it is coined in this country.

15. The method of extending gold used by the gold-beaters, consists in hammering a number of thin rolled plates between skins' or animal membranes. It may be beaten out into leaves so thin, that one grain of gold will cover 56 3-4 square inches. An ounce of gold upon silver is capable of being extended more than 1,300 miles in length.

#### SILVER.

17. Silver is a metal of a fine white color, without either taste or smell. It was well known to the ancients, and has for ages been used as money. It may be beaten out into leaves nearly as thin as gold. Its ductility is very remarkable; it may be drawn out into wire much finer

Spaniards perceive in Brazil? 9. 10. Is gold ever found in lumps? 11. Native gold—? 12. How is gold obtained from the ore? 13. In some places—?

14. What of the gold mines in the United States? 15. The method of extending gold? 16. What of silver? 17. What is meant by native silver?



than a human hair. Its tenacity is such that a very slender wire is capable of supporting a heavy weight. Silver is much more plentiful than gold, and it is a more useful though less precious metal.

17. Silver is sometimes found nearly pure, or as metal; in that state it is called *native*. But it is more commonly mingled with other substances, especially with antimony. It is purified by different means, according to the nature of its combination. The native silver is amalgamated with mercury, which is afterwards driven off, and the silver is left pure. When mingled with antimony or sulphur, the heating of it will drive them off, in fumes.

18. Norway possesses considerable silver mines, especially at Kongsberg, in the southern part of the kingdom. Here silver is found in greater abundance, and in larger masses, than in any other spot in Europe. The veins of ore extend to a considerable distance, and in several directions; so that new mines are opened continually. Out of one of these sometimes several hundred weights of rich ore have been obtained in a single week. This mine sinks perpendicularly above a thousand feet, having a very large width at bottom.



19. Thirty, or more, fires are seen blazing in different parts, which are kindled in order to soften the rock, and render the

working of it more easy. These fires, in such a deep pit, with swarms of miners, black and oddly habited, give it the appearance usually ascribed to the infernal regions. The similitude is aided by the general cry, when they are about to blow up a part, 'Take care of your lives.' A few years ago, four thousand persons found employment in these mines. The ore is usually obtained in lumps of a few pounds' weight; yet one mass was found worth six hundred pounds sterling; it is in the king's cabinet, at Copenhagen.

20. But the mines most famous, because most productive, are found in the mountain of Potosi, one of the high ridges of the Andes. The discovery of a mine is frequently owing to what is called chance, and the account of it usually interests us much. On this principle, the history of these mines may be given: An Indian, named Hualpa, pursuing some wild goats, in climbing after them, laid hold of a shrub on the side of the steep, in order to assist him. The shrub gave way, and to his surprise, discovered to his view a mass of silver.

21. This he secured, washed, and appropriated to his own benefit. He came again and again, to the same spot, for more, and found plenty. A friend observing him to grow rich, at last sifted the secret from him. For awhile they became partners of the treasure; but the friend was not able to refine his silver fit for use, and Hualpa, thinking he had revealed too much already, refused to show him the process. The other was so offended with this refusal, that he went and gave information of the mine; which was then seized for the king's use.

22. This mountain of Potosi may be said to consist of a mass of silver ore. The labors of man for three hundred years, have hollowed it out, almost like a

18. 19. What of the silver mines of Norway?

20. 21. What are the most famous silver mines?

honeycomb, but not exhausted it. The mountain resembles, in some degree, a sugar-loaf in shape. It is about eighteen miles in circumference, and chiefly composed of an argillaceous slate, full of irony quartz, in which the silver ore is intermingled. Above three hundred mines or pits have been wrought, but not with regularity; for the miners leave one for awhile, to seek for a new one, in hopes of finding more sudden wealth; neither have they proper machinery to clear off the water, which soon rushes in, and stops their operations.

23. Their ignorance in refining, too, was very great; for they could not obtain so much silver from the ore as might have been had; and what they did obtain, they got at an expense of quicksilver, which greatly reduced the profits. The miners' tools also were bad; and the whole process, from first to last, was managed without any science, in a clumsy and wasteful manner.

24. The city of Potosi, however, which owes its origin to the mines, is large and splendid, containing many noble and wealthy families. About thirty or forty thousand dollars are produced weekly from these mines, although they have been worked for so many years. Six thousand Indians are sent every six months, and compelled to dig in them. Some of the inhabitants of this city are said to be so rich, that their domestic utensils, their shovels, tongs, &c. are made of pure silver.

25. Between Potosi and the Southern Ocean, large lumps of silver are often found, by digging in the sandy soil. Several years ago, a new mine was discovered at a distance from the mountains, and within ten miles of the sea, called Huanta-

jaya; so rich that the metal was dug out with a chisel.

26. The uses of silver are well known. It is chiefly applied to the formation of various utensils for domestic use, for watches, and as the medium of exchange in money. A solution of silver in nitric acid, diluted with water, will stain the skin and other animal substances of an indelible black. It is thus employed for dyeing human hair, for staining marbles, jaspers, &c., and for silvering ornamental work.

#### QUICKSILVER.

27. Quicksilver, or, as the chemists call it mercury, is a substance of very great importance in the arts. By it our mirrors are silvered; it is the basis of several pigments, or colors for painting; it is used in various shapes in medicine; and its importance in the working of metals, by amalgamating with them, is very great.

28. The word amalgamation refers to that intimate union which is effected between quicksilver and several other metals, by grinding them together. The whole, thus united, is called an *amalgam*. Now, as we have spoken of this, and shown its use in refining gold and silver from all extraneous substances, we may as well pass on to the consideration of mercury.

29. It would be difficult to tell, with precision, why the old chemists gave the name of mercury to this substance. It is probable that the extreme fluidity, which seems to make it all alive, or as we say, *quick-silver*, which renders it so apt to run about, and so difficult to lay hold of and confine, may have suggested a resemblance to that active deity, who was feigned to be the messenger of Jupiter, always in motion, with wings to his cap and his heels; who was moreover with the ancients the

Mention the story of their discovery. 22. What of the mountain of Potosi? 23. The ignorance of the miners? 24. The city of Potosi? 25. Are

lumps of silver ever found? 26. What of the uses of silver? 27. Quicksilver? 28. What do you understand by amalgamation? 29. Why is



god of travelling merchants and of thieves; himself being extremely subtle and slippery.

30. Quicksilver is sometimes found in its fluid state, in the crevices of those slaty substances from which it is extracted. When found in a fluid state, it is in small quantities, and seldom more than a few drops together, exuding from the roofs or sides of the mines; though sometimes a hollow in the rock has been so situated as to catch a large quantity; this is very pure, and is called *virgin mercury*. They are sometimes gladdened with the bursting out of a drop or two, which increases to a stream, like a packthread in size, and which will run for several days together.

31. The principal mines of quicksilver are in Hungary, Friuli, in the Venetian part of Italy, and in Spain. But it happens conveniently for the gold mines of South America, that there is a considerable store of it in Peru.

32. The most usual form in which it is found, would not show what it is to the unpractised eye. It is intimately combined with sulphur, and has then the appearance of a reddish stone; in this state it is called *Cinnabar*. This is pounded and washed.

33. The entrance to the quicksilver mines of Friuli is on a level with the streets of the town, from which the descent is by ladders, into pits, ninety fathoms, or a hundred and eighty yards deep. Being so low, they are liable to inundations of water: powerful engines are constantly at work, to keep them fit for the miners. But the chief evil attendant upon the wretched people employed in them, arises from the mercury itself, which insinuates itself into the very substance of their bodies, especially by its effluvia, and

produces diseases of a dreadful nature, which are often very fatal.

24. Some of the people employed in these mines are condemned to work there for their crimes; and others are hired by the lure of high wages. When the mercury first gains power over their constitution, they are affected with nervous tremblings; then their teeth drop out, for mercury loosens every thing it touches; violent pains, especially in the bones, succeed, for the quicksilver penetrates their very substance; and then they soon die.

35. As it is chiefly from the vapors and fumes of the quicksilver that these effects proceed, the workmen take the precaution of holding in their mouths a piece of gold, which attracts the effluvia, and prevents the noxious matter from passing into the stomach. Yet cases have occurred, in which the metal had so completely saturated the body, that a piece of brass rubbed with the finger only, would become white, from the quicksilver oozing out of the man's flesh!

36. The ore in the mine of Juan Cabalaca, in Peru, resembles a brick half burned. This is broken and exposed to a considerable heat, which drives the mercury off, sublimed in smoke; this smoke passes through several pipes, into cucurbites or vessels filled with water. The water condenses the smoke, the particles of quicksilver in it sink to the bottom, and are taken out pure. Even here, the workmen become paralytic, and do not live long.

37. It has been matter of much dispute, whether quicksilver ought to be called a metal, a semimetal, or an imperfect metal. Its fluidity is a principal reason for doubting; now, you know all metals become fluid, if there be but heat

quicksilver called mercury? 30. Is it ever found in its fluid state? 31. Where are the principal quicksilver mines? 32. What is meant by cinna-

bar? 33. 34. What of the quicksilver mines of Friuli? 35. What precaution do the workmen take? 36. What of the ore in the mine of Juan

enough to melt them. Those who maintain quicksilver to be a metal, say, it only requires less heat to melt it than any of the others. Indeed, when its heat is taken away by the application of powerful freezing mixtures, it becomes hard, and is malleable, like lead.

38. Mercury is the heaviest body in nature, next to gold and platina. It is very fluid, separating with the utmost ease. It is also extremely volatile, passing into smoky fumes with a heat just above boiling water; yet then its metallic nature is not changed; its particles are only comminuted; for, if this vapor be caught in cold water, its heat is thereby abstracted, the mercury then falls to the bottom of the vessel, and unites in one fluid brilliant mass, as before.

39. As quicksilver is so necessary in the refining of gold from the ore, it must have been of great importance to Spain, when she had the mines of Mexico. At Almaden, in the province of La Mancha, in Spain, is the principal mine; which was wrought only on account of the king, to send over to America, to assist in working his gold and silver mines there.

40. In 1784, a great inundation took place, owing to something amiss in the machinery, which should have carried off the water. You may judge of the importance of this substance, when you learn, that Spain was then obliged to apply to Austria, for no less a quantity of quicksilver than six thousand hundred weight every year, for six years, till the Spanish mines could be cleared, and got into proper order for working again.

41. One considerable mine of quicksilver is at Idria, a town of Carniola, a province of Austria; not far from the upper part of the Adriatic or Gulf of Venice.

42. This mine was not known till 1497,

when the mode of its discovery was rather curious. A few coopers inhabited that part of the country, for the convenience of being near the woods. One day, one of them having made a new tub, and being desirous to prove its soundness, placed it where the water dripping from



the rock might fall into it; in the morning, it seemed to stick to the ground; and at first he, in his superstition, thought it was bewitched; however, examining it more closely, he found something fluid, but shining, and very heavy, was at the bottom of the water in his tub.

43. Not knowing what it was, he took some of it to a neighboring apothecary, who shrewdly gave the man a trifle, and bade him bring all he could find of that odd stuff. The story, however, soon became public; and a company was formed for searching the mountain, and working the mine.

44. We will conclude this account by quoting an interesting description by a traveller, of a descent into this quicksilver mine of Idria in Germany.

45. 'I thought I would visit those dreadful subterraneous caverns where thousands are condemned to reside, shut out from all hopes of ever seeing the light of the sun, and obliged to toil out a miserable life under the whips of imperious

Cabelaca? 37. Ought quicksilver to be called a metal? 38 Is mercury or quicksilver a heavy

body? 39. 40. What is said of the quicksilver mines of Mexico? 41. Idria? 42. 43. The disco-



task-masters. Imagine, to yourself, a hole in the side of a mountain, about five yards over: down this you are lowered, in a kind of bucket, to more than a hundred fathoms, the prospect growing still more gloomy, yet still widening, as you descend. At length, after swinging in terrible suspense for some time in this precarious situation, you reach the bottom, and tread on the ground, which, by its hollow sound under your feet, and the reverberations of the echo, seems thundering at every step you take.

46. 'In this gloomy and frightful solitude, you are enlightened by the feeble gleam of lamps, here and there dispersed, so that the wretched inhabitants of these mansions can go from one place to another without a guide; yet I could scarcely discern for some time any thing, not even the person who came to show me these scenes of horror.

47. 'From this description, I suppose you have but a disagreeable idea of the place; yet let me assure you it is a palace, if the habitation be compared with the inhabitants; such wretches my eyes never beheld. The blackness of their visages only serves to cover a horrid paleness, caused by the noxious qualities of the mineral they are employed in procuring.

48. 'As they in general consist of malefactors, condemned for life to this task, they are fed at the public expense; but they seldom consume much provision, as they lose their appetites in a short time, and commonly, in about two years, expire through a total contraction of the joints.

49. 'In this horrid mansion, I walked after my guide for some time, pondering on the strange tyranny and avarice of mankind, when I was accosted by a voice behind me, calling me by name. I turned,

and saw a creature, black and hideous, who approached, and, with a piteous accent, said, 'Do you not know me?' What was my surprise to discover the features of a dear friend! It seems he had fought a duel with an officer, against the emperor's command, and left him for dead; and he had been punished by banishment for life, to labor in these mines.

50. 'While he was speaking, a young woman came up to him, whose air showed her to have been born to better fortune; even this dreary situation could not destroy all her beauty. She was his wife! She was daughter of a high family in Germany. Being unable to procure her husband's pardon, she had affectionately determined to share his bondage with him.

51. 'It is proper to add, that the officer did not die. When he recovered of his wounds, he, with great magnanimity, solicited pardon for his antagonist, and obtained it. So that in a few months the lady's brother came to enjoy the most affecting scene of delivering them both from the mines; and restoring them to the favor and fortune to which they were entitled by birth and mental endowments.'

#### PLATINA.

52. Platina is the heaviest of all metals. Its color is that of the purest silver. It is very difficult of fusion, and has been kept in the most violent heat of a glass furnace, for several days, without undergoing any alteration.

53. Platina is a metal of comparatively recent discovery. It appears to have been first mentioned in 1735; and a quantity was carried to England from Jamaica in 1741.

54. The part of the world where platina is found in the greatest abundance, at the present day, is South America. Santa

very of this mine? 44—51. Give the traveller's account of a visit to this mine. 52. What of platina? 53. Is it a metal of recent discovery?

When is it first mentioned? 54. Where is platina found? 55. Where has it been coined into money?

Fe, near Carthagera, is the only place in South America where it is to be met with, and hence the Spaniards have been in the habit of procuring it since the year 1750, or thereabouts.

55. Platina has lately been discovered in Spain; and there are said to be two ancient candlesticks in a cathedral in Germany, apparently made of it, before America was discovered. More recently platina has been discovered in Russia and Siberia; and in the former place it has been coined into a beautiful piece of money, assuming a value next to gold.

## CHAP. XXII.

### USEFUL METALS.

#### IRON.

1. Iron is the most abundant and useful of all metals. It is found almost every where; at least, in all mountainous countries. Possibly it might be found in valleys also, if men would dig deep enough; or rather, if they could do so; for the waters would rush in, and prevent their operation, in low situations.

2. Iron is so generally diffused, that there is scarcely a stone, or even a cabbage-stalk, but what, properly treated, would yield it; though not in such quantities as would pay the expense of the scientific management.

3. Norway exports several hundred thousand quintals of iron, chiefly wrought into bars. A few miles from Christiansand are several iron mines, the ore of which is fused with less difficulty than usual. They therefore mix it with ores which are more refractory, which by its aid are managed with greater ease.

4. Wood is extremely scarce thereabouts; but, being near the sea, the ore is shipped off to places more convenient for

the founderies. The principal iron-works are at Moss. There, three or four hundred tons are melted at a time, in each kiln. The furnace is kept in constant heat and action, day and night, for about ten months together in every year. A cannon foundry is closely connected with the furnace.

5. Russia is one of the principal places from which we obtain iron; and our use of that metal is so great, and so constantly increasing, that our own stores are found to be insufficient. At Katherineburgh, in Siberia, are the principal iron-works, belonging to the government. Here the river Isset has a dam across it, two hundred yards long, six yards high, and forty broad, by which the water is raised to a sufficient height to work the several mills, and powerful engines, requisite for working the mines advantageously.

6. Iron appears to exist in plenty through many parts of North America. Some mines have been opened, and are wrought to considerable advantage, on James River. As the same plot seems to be well stored with coal, no doubt the produce of these mines will, some day, yield great emolument to the proprietors.

7. England abounds in mines of iron. When these are adjacent to coal mines, the benefit is very great, as the ore can be worked at a trifling expense. These mines are found chiefly in the northern counties; Durham, Yorkshire, Lancashire, and Shropshire, have many forges and smelting-houses. The forest of Dean, in Gloucestershire, has long been famous both for its oak-timber above ground, and its iron mines beneath.

8. Swedish iron is reckoned among the best found any where, especially for small wares and cutlery, as is well known at Sheffield and at Birmingham. Great

1. What of iron? 2 Is it generally diffused?  
3. 4. What of the iron mines of Norway? 5.

Russia? 6. Iron in North America? 7. England?  
8. Sweden? 9—13. What is Mr. Wrasall's de



quantities are smelted in Dalecarlia, where Gustavus Vasa hid himself. If we should like to descend into an iron mine, we had best take our description from a famous one in Sweden. Mr. Wraxall's visit to that at Danmora, is quite to our purpose. In most mines, the ore is dug out; but in this, the whole is loosened by gunpowder; and the subterraneous explosions caused by this operation are most terrific.

9. The stones are thrown up, by the violence of the powder, to a vast height above the surface of the earth; and the concussion is so great, as to shake the surrounding rock on every side.

10. Mr. Wraxall arrived at the mouth of the great mine, which is half a mile in circumference, just in time to witness one of these explosions, which take place every day at noon. As soon as the explosions had ceased, he determined to descend into the mine. The inspector of the mines remonstrated against it very strongly, but finding him determined, a clean bucket was provided, and he got into it, with two men to accompany him: this bucket was fastened to a rope; and he almost repented of his temerity when he had descended about half way, for he could but just see the sky over his head, and in the deep dark abyss below he could discern nothing; neither could he touch the sides.

11. Had the rope broke, all the three must have been dashed to pieces. He continued suspended in this manner nine minutes, slowly descending, before he touched the bottom; for the mine was four hundred and eighty feet deep; exceeding the height of St. Paul's Cathedral, as much as if half the Monument were to be placed on the top of it.

12. When safely at the bottom, the view around him was awfully sublime.

Daylight was very feeble at that great depth; in many places it could not penetrate, and flambeaux were used. There were huge frames of wood stretching across from one part of the rock to another, on which the miners sat, with great unconcern, boring holes for the powder, against the next day's explosion. Yet at such heights were the men at work, that on any false balancing, they must have fallen, and been dashed to pieces. The fragments torn up by the explosion which had taken place just before his descent, lay about in wild confusion, which made the scene the more appalling.

13. He remained three-quarters of an hour in these gloomy caverns, traversing every part of them with his guides. Thirteen hundred workmen are employed in them. Ice and cold surrounded him here, although, above, the weather was quite warm. In one of these remote caverns were eight miserable wretches, warming themselves at a charcoal fire, eating their scanty pittance, and resting awhile from their dreadful occupation.

14. We may add to this a quotation from Mr. Coxe, who travelled thither.

15. 'I stepped into a bucket, and hung suspended in the open air, in the same manner as if a person were placed in a basket at the top of a high spire, and gradually let down to the ground, by a rope and pulley. While I hung suspended in mid air, and so giddy that I could not venture to look down, I observed three girls standing on the edge of the bucket which was ascending, and knitting, with as much unconcern as if they had been on firm ground. My curiosity was soon satisfied; I was drawn up again in the same manner, and to prevent giddiness, I closed my eyes.'

16. The iron mines of Sweden employ

scription of a visit to the mine at Danmora?

14. 15 Mr. Coxe's description? 16. How many

twenty-five thousand persons; and fifty-seven thousand tons of metal are produced every year.

17. Iron is not often found in a metallic state, but most commonly in reddish-brown stony lumps; sometimes fibrous.

18. The first operation is, by violent fire, to reduce these stones to a state of fusion. This is done in vast furnaces, where the heat is excited, and kept up for months together; fresh fuel and fresh ore being laid on the top in alternate layers. As the metal melts, it drips down through the bars of the grate, into a channel, which conveys it into hollows made in sand, where it hisses, boils, and eventually sinking, cools, in the shape provided for it. The larger masses of iron thus obtained, are called *sows*, and the smaller sort are called *pigs*.

19. This cast-iron is harsh and unmanageable; being very brittle, it flies and cracks under the hammer. Its parts are globular like so many iron peas, just adhering together, and separating with a blow. Cast iron must therefore be wrought, with hammers of great weight, lifted by mill-work. This immense power, while the iron is in a melted state, forces these round globules into a longer shape, till they become threads; and by being frequently wrought, these threads become intertwined, so as to produce great toughness, although there is great pliability also. Or, the iron is made excellently malleable by passing it, while in a state of fusion, between immense rollers. Although Swedish iron is reckoned the most pliable, yet English iron becomes equal to it, when it is wrought with sufficient labor. Spanish iron is apt to crack; and German iron is too coarse, except for ordinary purposes.

persons are employed in the Swedish mines? 17. How is iron generally found? 18. What is the first operation with it? What is meant by *sows* and *pigs* of iron? 19. What of cast-iron? 20.

20. *Steel* is iron highly wrought, and refined by a process in which, being heated, but not fused, with charcoal, bones, leather, and such matters, it imbibes some sulphureous principle, which renders its grain finer, the fibres more elastic, and the whole surface more susceptible of a polish. It thus becomes admirable for all finer wares, and all cutting tools, where the edge must be extremely thin, and yet very strong; as knives, razors, lancets, &c.

21. There are two places in Great Britain well worthy of mention, for the extent of their iron works. One is *Colebrook-Dale*, in Shropshire. The other is in Scotland, called, from the river on which it stands, the 'Carron iron-works,' just above where the river enters the Frith of Forth.

22. At the latter place, above a hundred acres of land have been converted into reservoirs, to supply the machinery with the continual power of water; by which eighteen large wheels are turned. Sixteen hundred men are in constant employ, whose weekly wages amount to almost seven hundred pounds. Six thousand five hundred tons of iron are smelted every year.

23. At these most extensive works, are cast five thousand pieces of cannon annually; some of them are ship's guns, carrying balls of thirty-two pounds' weight, the gun itself weighing forty-two hundred weight. Huge cylinders are also cast here, for steam-engines, and various other machinery. Also kitchen cooking machines, ovens, stove-grates, &c. down to articles of diminutive size, and great nicety of workmanship.

24. Iron ore is abundantly scattered throughout North America; and the re-

What is steel? 21. What are the two places in Great Britain worthy of mention for their iron-works? 22. 23. What of the Carron iron-works? 24. What of iron in the U. States? 25. What of



sources of the United States with respect to this metal, are very considerable. The manufactories of iron are numerous; and all the various articles from cannons and heavy machinery to spikes and nails, which are formed of this useful metal, are now made, in an ingenious and excellent manner, in this country.

#### COPPER.

25. Copper is a well known metal, so called from its having been first discovered, or at least wrought to any extent, in the island of Cyprus. It is of a fine red color, and has a great deal of brilliancy. It has a sensible odor, especially when rubbed or heated, and is of an unpleasant taste. Copper, in point of usefulness, yields only to iron; it is widely dispersed, being found pure, and also combined with various mineral substances. It is much used for alloying gold and silver.

26. Copper is usually found in mines deep down in the earth; though some few mines are open to the air, as the mine in the Pary's mountain, in Anglesca, in Wales.

27. It is generally the case, that when a country is rich in ores underneath the surface, it has no rural beauties. This is especially the case where mines of copper are found, for the fumes of it are destructive to vegetation. As you come near to Pary's mine, you see nothing but rough shapeless rocks, piled one upon another, till you approach a large basin, or wide pit, having on one side a small lake, which no bird ever sips at. The fumes which rise all around from the burning heaps of copper, are enough to suffocate one, if incautiously inhaled. Mosses and lichens, which grow on every other rock, cannot live here.

28. The ore is abundant in sulphur,

from which it is purified by burning. After being broken into lumps about the size of an egg, it is placed between two very long walls, twenty or even fifty yards in length, equally distant in every part, and about four feet high. The ore is piled up, not only to the height of those walls, but much above them. The top is then roofed over with flat stones and clay, so closely, that the fumes cannot escape, or the walls are sometimes completely arched over, with bricks for this purpose.

29. At regular distances flues are formed at the top of these arches, which stride to a considerable distance, bending over like a Gothic arch. The fumes of the sulphur, which rise from the ore when it is set on fire, rise up these flues, and being cooled by the length through which they pass, they strike against the top of the arch, and fall down in a very fine dust of sulphur. This is gathered, melted, and run into moulds, when it becomes the *Stone-brim* stone of the shops. These vast mounds of ore take several months to burn; four, six, or even ten months.

30. This loss of the sulphur reduces the ore to one-fourth of its original bulk, but it is now good copper. It is then pressed and washed, to fit it for the market. The water used on this occasion becomes strongly impregnated with copper, which the acid of the sulphur had dissolved. This water is carefully stored in proper pits, as is all the water they find in the mines; because, from this, some of the finest metal is extracted, by a very curious process.

31. The pits are thirty or forty feet long, half as much broad, and nearly two feet deep. Into these pits, full of the impregnated water, they put a considerable

copper? 26. How is it usually found? 27. What of the rural appearance of a country, which is rich in ores? 28. Does the ore abound in sulphur? How is it purified from that substance?

29. How is the stone-brimstone of the shops obtained? 30. What is done with the ore when purified? What of the water used on this occasion? 31. What are put into these pits? 32. 33. 34.

quantity of iron; old iron bits, bars, or broken anchors, will do; but it is found best to procure new plates of iron, four feet long, half a yard broad, and almost an inch thick. The particles of copper floating in the water precipitate themselves upon the iron; which is in the mean while dissolved by the acid liquor, into a yellowish ochre. The iron pieces are frequently taken out, and the copper on them scraped off. This is repeated till the iron is wholly consumed; and the copper thus obtained is the purest of any.

32. The appearance of this Pary's mine is uncommon, because it is in a manner open to the day; being a large pit, a hundred yards long, about forty yards wide, and twenty-four yards, or above seventy feet deep. The copper ore is cut out, as stone from a quarry, in large lumps. At the ends of this pit are deep hollows cut, penetrating into the mountain; the roofs of which are supported by pillars of metallic ore, left untouched. These caverns wind a considerable way under ground, but the whole mass over them, sides, and roof, will disappear, as they proceed in cutting the ore away.

33. The sides of this open pit are almost perpendicular. The descent into it is only by rugged steps, cut in the rocky ore, in a few places, assisted by several ladders, and a rope to hold by. The most surprising part of the operation, is the obtaining the ore from the sides of this pit. Wooden platforms are projected from the top of the opening.

34. A windlass on each serves to lower and raise the baskets which convey the miners; who thus descend down the steep sides to the part where they work, on the upright face of the precipice. There they get out the ore with pickaxes, or blast it with gunpowder; tumbling down the

masses of ore, with a thundering noise, to the bottom of the pit.

35. Vast mines of copper are wrought in the county of Cornwall in England. That county is chiefly famous for tin; but the copper is also in abundance, and of great importance. Large lumps of native copper, of considerable purity, are found there, not very deep in the soil. But the ore is plentiful, and in constant working.

36. Much copper, and of the purest kind, is obtained from the lumps of mundic, or marcasite, found in the tin mines. These lumps were, for years, regarded as of no value, and were thrown away; but science has now discovered a mode of extracting copper from them, to the amount of a hundred and fifty thousand pounds sterling per annum; and it is equal in goodness to the Swedish.

37. There is a peculiar copper mine at Ecton Hill, near the river Dove, in Derbyshire. Thirteen thousand pounds were spent in searching before any ore could be found; then, at two hundred yards' depth, vast quantities were discovered. The peculiarity of this mine is, that the ore does not spread in veins, hither and thither, as is commonly the case, but sinks down perpendicularly, widening as it deepens, in the shape of a huge bell. It is the deepest mine in Great Britain.

38. Sweden abounds in copper, which is in high esteem: this is principally found in the province of Dalecarlia, whence also comes their iron. These mines have been wrought for ages. On approaching them, one is amazed by the huge machines constructed to draw up the ore, some of the water-wheels being above forty feet in diameter. A great chasm appears, of extraordinary depth; for the caverns dug out not being properly supported at first, the whole fell in.

What is said of Pary's mine? 35. Copper in Cornwall? 36. May copper be obtained from the

lumps of marcasite found in the tin mine? 37. What is said of the copper mine at Ecton Hill?



39. You pass into this great mouth by wooden stairs, which are carried over the wild mass of fallen rocks. After this deep descent, you proceed horizontally. The day-light is soon lost, and the close vapors become offensive, especially as you descend still lower down these winding steps. The pestilential fumes, the darkness, and the rocks, give a dreadful appearance to the whole. The workmen seem like unsubstantial spectres, rather than living inhabitants of the earth. At one part, the steam is so hot as to scorch; and the sulphureous stench is intolerable.

40. In long winding galleries, and high-roofed caverns, the workmen, almost naked, are seen hewing out the rich ore, and wheeling it in barrows, towards the spot where the buckets hang, which are to raise it above ground.

41. It takes an hour to go down to the bottom of this pit, as it is twelve hundred feet deep: five hundred men are employed in it; and it was here that the great Gustavus Vasa hid himself, as a common laborer, before he was raised to the throne.

42. A Laplander, travelling with his rein-deer, near Drontheim, in Norway,



discovered copper; which, on examination, led to the opening of a considerable and productive mine. This has been

wrought almost two hundred years. Some of the veins are almost worn out, but the eastern division is still productive. The foulness of the air makes the work very oppressive; and sometimes a sugary taste upon the lips, warns the workmen to flee. Gunpowder is used to split the rocks and loosen the ore, which is principally of a gravelly nature.

43. Very fine copper is found in Japan; some of it, indeed, is mixed with gold, which they separate. They cast it into small cylinders, the size of one's finger, and something longer than one's hand.

44. Copper is indeed distributed widely; scarcely a mountainous country but has its copper mines. Ireland, Hungary, Spain, may be added to those named in Europe; while the south of Africa, Hudson's Bay, in North America, and especially Peru and Chile in South America, are plentifully stored with this valuable ore.

45. One of the largest masses of native copper ever noticed, was discovered by Mr. Schoolcraft, in the North West Territory, about thirty miles from lake Superior. It weighs, by estimation, 2200 pounds. Copper is met with in considerable quantities in several parts of the United States; but it is not wrought yet to a great extent.

46. Copper is applied to many useful purposes. It is formed into thin sheets by being heated in a furnace, and subjected to pressure between iron rollers. These sheets are used for the sheathing of the bottoms of ships, the covering of roofs and domes, the constructing of boilers and stills of a large size &c. The use of copper in engraving is also very considerable; although steel is now preferred as being harder and more durable.

47. Copper may be drawn into wire of

38—41. Describe the copper mines of Dalecarlia in Sweden. 42. What is said of the Laplander's discovery of copper in Norway? 43. Is copper

found in Japan? 44. In what other countries does it abound? 45. Where was found one of the largest masses of native copper ever known?

great tenacity, or beaten into very thin leaves, though not so thin as gold may be beaten. *Verdegris*, an article of considerable use in the arts, and in dying, is made from copper; it is the rust of the metal, and exhibits a beautiful green. It is a deadly poison.

#### BRASS.

48. One of the most brilliant and useful productions obtained from copper, is brass. This is formed by the addition of zinc. A brown stone called calamine, is an ore of zinc; if layers of copper are intermingled with layers of calamine in powder, and charcoal, the application of a strong heat will drive out the zinc in vapor which will penetrate the copper, and change it into brass, which is very different in color, and much harder. By this process, copper loses its malleability, and is less liable to rust.

49. The manufacturing of brass seems to have been very anciently discovered, as we read of its being known before the flood (*Genesis*, iv. 22.) The earliest accounts we have, represent many weapons of war as being made of it, as well as most of the money.

50. The best brass consists of four parts of copper to one of zinc; and when the latter is in greater proportion, compounds are formed called *tombac*, *Dutch gold*, and *pinchbeck*. Brass is much used in the small wheels and other nicer parts of watch-making.

#### BELL-METAL.

51. Bell-metal is composed of eighty parts of copper and twenty of tin. Its color is grayish white; it is very hard, sonorous, and elastic. Less tin is used for church bells than for clock bells; and in very small bells, a little zinc is added to the alloy.

46. To what purposes may copper be applied? 47. What of verdegris? 48. Brass? 49. Was its manufacture known to the ancients? 50. Of

### CHAP. XXIII.

#### USEFUL METALS.—CONTINUED.

##### TIN.

1. Tin is a metal, which has a fine white color like silver. When fresh its brilliancy is very great. It has a slightly disagreeable taste, and emits a peculiar smell when rubbed. It seems to have been one of the earliest articles of commerce in Britain; for the Phenicians traded to England for tin, five hundred years before the Christian era.

2. They called Britain, *Baratanac*, or *the land of tin*; and some have even thought that to be the origin of the present name of the Island. It is an article of considerable exportation to this day. Some countries in Germany have mines of tin; but the supply is not in any quantity beyond what is sufficient for their own use. It is England which affords to most other nations this simple and useful material. The tin mines are situated in Cornwall and Devonshire, where are also many productive mines of copper.

3. In some places, the ore of tin bears so much the appearance of common stones, that it is only by their great weight that the presence of tin is discovered. In other parts, tin and earthy substances are so intimately mingled, that they seem like a stone, of a bluish-gray color.

4. The ore is usually found in veins, called by the miners a *lode*. These veins penetrate the hardest rocks. Small veins are first discovered, not more, perhaps, than half an inch in diameter; but they increase in substance as they are followed. The direction of these veins is usually east and west. Frequently, masses of ore of twenty pounds' weight, are found; sometimes the vein, or lode, breaks off sudden-

what does the best brass consist? 51. What of bell-metal?

1. What of tin? 2. What was Britain called by



ly, and they have to hunt for the continuation; miners who are accustomed to this, are aware, that a little on one side they shall find the broken vein; they dig, therefore, and in general soon discover it.

5. They follow thus the lode, or vein, let it wind which way it will, through the flinty rock. When the waters become troublesome, they are pumped up by machinery, kept constantly in motion by steam-engines. Sometimes it is more convenient to cut a drain, called an *adit*, sloping downwards, to let them off; when this can be made, it saves, when once constructed, much expense.

6. To raise the ore to the surface, they frequently sink a shaft, just over the spot in which they want it. Herein, the geometrical knowledge of the captain of the mine appears to advantage; whatever may be the windings of the mine below, he traces similar windings on the surface above, and tells the workmen where to begin sinking the shaft, or well, at the same time those below begin working upwards; and both work on till they meet.

7. In this case, if those above should be but half a yard perpendicularly away from those below, it would be thought a bungling job. The rope to descend through the shaft must hang perpendicularly; if it press against the sides, it will not work.

8. At the top of this shaft is placed a windlass, by means of which the kibbuts, or baskets of ore, are wound up.

9. Near St. Austle, in Cornwall, is a tin mine, which has not less than fifty shafts, half of which are still in use. Some of these veins have been worked a full mile in length. The depth of the shaft is nearly seven hundred feet.

10. At St. Austle's Moor, there is another mine of stream tin. Into a narrow valley, about three miles long, many small

streams from the hills empty themselves. Almost stagnating, they have formed a collection of soil, nearly twenty feet deep; and the several materials of which this is composed, have settled, the heaviest at bottom, of course, into several strata.

11. The first strata are earth, clay, and gravel; then comes a stratum of more stony substances, and firmer consistence; these reach to the depth of ten or twelve feet. Beneath these comes a layer of tin stones, some as big as an apple, some small almost as sand. The tin found in these stones is very pure. At the depth of eighteen or twenty feet, you come to the solid rock, in which is no tin. They wash off the earth, sand, and gravel, by conducting narrow streams of water through the most promising parts, and thereby they lay bare the tin stones with tolerable ease.

12. The ore, when raised out of the mine, is broken in stamping mills, the lifters of which are kept in action by water-wheels, and are shod with iron. They continue stamping till the ore is small enough to pass away through an iron grating beneath. A run of water in the mean time helps to cleanse it.

13. The next process is to melt it, which is done in furnaces built on purpose; the melter having about one-third of the produce for his trouble. It is then assayed, to examine its fineness. When it has been run into large blocks, it must be coined, before it can be marketable. This is done by the proper officer, who cuts off from one corner a small part, and then stamps it with the seal of the Dutchy of Cornwall, and the name of the smelter. A duty of four shillings on every hundred weight is paid to the Prince of Wales, as Duke of Cornwall. This brings in from ten to thirty thousand pounds per annum.

14. The substance of *pewter* is tin; the

the Phenicians? 3. 4. What is said of the ore? 5. How do they follow this vein? 6. 7. 8. How do

they raise the ore to the surface? 9. What of the Cornwall tin mine? 10. 11. St. Austle's Moor?

other metals mingled to make it pewter, are lead and brass, in small quantities. When pewter plates, &c. were displaced by the introduction of earthenware, one considerable market for tin was destroyed.

15. In the operation of making *tin-plate*, very thin plates of iron are covered with a coat of tin; which gives to the tin more solidity and firmness than it possesses naturally. These tin-plates are then wrought into utensils of great variety, for domestic service, being very cleanly and wholesome.

16. The process is as follows: Thin plates of iron, perfectly clean and bright, are dipped into melted tin; which is kept in its metallic state by a covering of melted tallow, by which it is defended from the air. The affinity between the two metals is such, that the iron is instantly, and firmly, covered with a thin layer of tin. This tin covering keeps the iron from rusting, and also renders it very pliable under the hammer; so that it is easily formed into many culinary articles. The surface of this tin-plate is rendered peculiarly smooth, by being passed between powerful rollers.

17. The inside of copper and iron vessels can also be covered with a coating of tin. To perform this, the inside of the vessel must be well cleaned, by rubbing it with an acid or with sal-ammoniac. The tin is then melted in the vessel, and by the help of old rags doubled up, is spread all over the surface, wherever it is wished that it should adhere.

18. Tin makes part of the cargoes sent out to China. The Dutch made great profit, by supplying the Chinese from some mines of tin in Sumatra. The East-India Company, therefore, determined to share with them in this trade, by sending out

annually many tons of tin, from the English mines in Cornwall.

#### LEAD.

19. Lead is of a bluish gray color; it is upwards of eleven times heavier than water. Next to iron, lead is the most extensively dispersed, and is one of the most abundant of metals: it has never been found pure, but mostly combined with iron, manganese, antimony, silver, or their ores. The lead used for common purposes is obtained from an ore called galena, or sulphurate of lead.

20. About seven or eight hundred pounds weight of lead are obtained from a ton, that is, twenty hundred weight of ore; there is commonly a mixture of silver with lead; and a ton of the metal will yield nearly fifty ounces of silver.

21. Lead is one of the softest of metals; it may be cut with a knife, yet it is not very ductile; for it cannot be drawn into wire, nor can it well stand the pressure which might make it into a thin leaf; it so easily cracks. Yet the closeness of its particles is such, that it is the heaviest metal, next to gold and silver.

22. All mechanics who work in lead, suffer more or less from its poisonous effluvia. Even when transformed into white lead for painting, the artificers are afflicted with a peculiar, and very terrible sort of colic.

23. Lead is easily calcined by fire, or converted into a fine powder. And this powder is made to take a variety of beautiful colors, according as the heat is managed, from yellow called *massicot*, to a fiery red called *minium*, or more commonly, *red lead*. It may even be converted into glass, opaque as it is; and much of it is used in making that transparent

12. What is done with the ore? 13. The next process? 14. What of pewter? 15. 16. How is tin plate made? 17. The inside of copper—? 18. Is tin sent to China? 19. What of lead? 20. How

many pounds may be obtained from a ton of the ore? How much silver? 21. What of the properties of lead? 22. The poisonous effluvia? 23. May lead be calcined? What is massicot? Minium?



body. Sugar of lead, which is a salt drawn from it by vinegar, is extremely sweet; but it is one of the rankest poisons we know of.

24. Lead is forced through a mill of peculiar construction, by the glaziers, so as to produce a groove on each side, for holding the small squares of glass in case-ments. It is also, by wooden rollers, made into flat sheets, three or four feet wide, and of still greater length; in which state it is used for sinks and cisterns, or for covering houses.

25. Melted lead is poured through revolving sieves, raised to a great height, over a cistern of water, to form shot; the revolving sieves let it through in small drops while liquid; and in that liquid state the pressure of the atmosphere makes every single drop perfectly round; it however cools in falling from so great a height, and, dropping into water, it is not flattened, but retains its roundness. In this manner shot is formed, for sportsmen. Different sized sieves make the shot larger or smaller, by letting through more or less of the melted lead.

26. The ore of lead is sometimes dug out with a pickaxe, and sometimes the mine is blasted with gunpowder. But I have found a story which may amuse you, while it shows the manner of the operation. It is taken from Gilpin's Picturesque Tour in Scotland:

27. 'A gentleman, of the name of Lothian, had long sought ore, in the hills near Cory-lin, but in vain. Many a time he resolved to desist, but the workmen raised his spirits with fresh hopes: sometimes, they said the rock was just cut through, which had occasioned so much delay; or the soil was manifestly marked with signs of ore; or springs were found which had the true mineral tinge. They

thus deluded him with false hopes, till he was almost ruined.

28. At this crisis, a boy came secretly to him, and told him that the men were deceiving him; that ore had been found, and was hid up from him. Mr. Lothian perceived the depth of their roguery; they intended to ruin him, and then hoped to take the affair on themselves, at a low rate. The boy declared he should be murdered if it were found out that he had given this information.

29. Lothian encouraged the boy, and told him, that the next morning he would come into the mine as usual, and finding the boy idle, he would scold him. It was agreed that the boy should feign to be in a passion at being scolded, and should, as in anger, throw down his tools as near the place where the ore had been found as possible: this was done accordingly. He struck the boy for his idleness, and the boy, in apparent anger, threw down his tools, and declared he would work for him no longer.

30. Lothian marked the spot, without seeming to notice it. He began talking with the men as usual, and received the usual answers. At length, he took up a pickaxe, and began striking here and there, carelessly, till by degrees he came



to the proper place; when he soon discovered the ore, and, as if greatly sur-

Sugar of lead? 24. For what is lead used? 25. Describe the process of manufacturing shot.

26. What of the ore of lead? 27—30. What is the story about Lothian and the workmen?

prised, called all the men to examine if this were not the right place to work at. They were loth to own it; but, as he continued picking, they were obliged to see, and at his command they dug deeper. When they could resist the discovery no longer, they affected to wonder how they could have worked so near, and not found it before. The ore proved to be very rich, and he soon recovered his finances.'

31. The lead mines of the Mississippi are very productive. The tract is more than 200 miles in extent, and contains inexhaustible quantities of lead ore. The chief mines are in the neighborhood of Galena in the northwestern part of Illinois. Here are the richest lead mines on the globe. There are very productive lead mines in the neighborhood of Potosi, in Missouri. The ore is found not in veins, but in detached masses from two to twenty feet below the surface of the ground. About 3,000,000 pounds are annually smelted.

#### NICKEL.

32. Nickel is found in different parts of Germany. When perfectly pure, it is of a fine white color, resembling silver. It is more malleable than iron. It is attracted by the magnet as strongly as iron, and may be converted into a magnet. Nickel is employed in potteries, and in the manufacturing of porcelain. A beautiful green color may be obtained from it.

#### ZINC.

33. Zinc is a metal of a brilliant white color, with a shade of blue, and is composed of a number of thin plates adhering together. The ore is often found in great quantities, in lead mines.

#### MANGANESE.

34. Manganese is about seven times heavier than water. Its color is a rusty

gray. It is brittle, in a slight degree malleable, and is never found pure. It is used in glass-making, and a beautiful violet color is obtained from it, which is employed in painting porcelain.

#### ARSENIC.

35. Arsenic is a metal of a light lead-blue color. It is a substance of very frequent occurrence, being found in combination with almost every other metal, as well as with sulphur and lime. Arsenic is one of the most active of mineral poisons, and a very small quantity of it is able to destroy life. It is also sometimes used as a medicine, and, when judiciously employed, is capable of producing the most powerful and beneficial effects. Arsenic is much employed in the arts. It is used in glazing porcelain, and the manufacture of glass. It is also much used in the composition of paint.

#### ANTIMONY.

36. Antimony is a substance separated by fusion from a very hard and heavy lead-colored metal, which has a sparkling appearance when freshly broken. It is employed in medicine and in coloring glass. It is also used in the composition of type-metal.

#### COBALT.

37. The weight of this metal is about eight times that of water: its color is gray with a tinge of red, and it is very difficult of fusion. It is attracted by the magnet, and a beautiful blue color may be obtained from it. The solution of muriate of cobalt affords a celebrated sympathetic ink. When much diluted, if letters are traced with it on paper, and allowed to dry, they are invisible; but when the paper is exposed to a moderate heat, they appear of a lively green. They disappear again when cold, but by a very strong heat they may be rendered permanent.

31. What of the lead mines of the Mississippi? How is the ore found? 32. Nickel? 33. Zinc?

34. Manganese? 35. Arsenic? 36. Antimony? 37. Cobalt?



## CHAP. XXIV.

## COAL.

1. Coal appears, in some cases, to have been originally vegetable matter, and, by long burial in the earth, to have been soaked with bitumen, till its very substance has been changed; for sometimes it has been found but partially changed, with the fibrous formation yet discernible. More commonly, however, it seems to have been some earthy substance, thus impregnated and changed, by petroleum, or some oily matter.

2. England is highly favored by this kind provision of fuel, suited to her cold climate, and especially necessary for a manufacturing country. For ages, indeed, wood was the only kind of firing in use; and as the island was anciently so much covered with timber, the commodity did not become scarce. As, however, population increased, and corn was wanted, the forests were cut down, and the land brought into culture, so that in some districts fuel became scarce and dear.

3. In countries where coal abounds, it was impossible but some particles, at least, must have been washed out of the earth by the floods. This takes place to the present day. That these black stones would burn was the next discovery, and searching for them was as natural, when wood became difficult to procure.

4. Newcastle-upon-Tyne, in Northumberland, is a principal coal country. Henry III. gave the inhabitants the first charter for digging coal, about the year 1239. They were, however, forbidden to be brought to London at one time, till the destruction of the woods about the city rendered some other supply of fuel necessary. At present, the quantity is very great: in the year 1800, eight hundred

and sixty-six thousand eight hundred and ten chaldrons were brought to London. A chaldron contains thirty-six bushels. The quantity increases every year, and fully keeps pace with the great increase of houses.

5. That the various substances underneath the soil lie all in strata, has frequently been stated. Coal is found in this manner. Sometimes the stratum is many feet thick, sometimes not more than six inches. When found, it is followed, and though thin at first, it soon becomes more profitable. In following the vein of coal, the miners are obliged to go far into the bowels of the earth, and sometimes to great depths.

6. The coal mines at Whitehaven in England are very wonderful. You enter at the bottom of a hill, and pass an amazingly long way among huge galleries, where the roof is propped up by vast pillars of coal, left for that purpose, nine feet high, and thirty-six feet thick. The mines sink to the depth of seven or eight hundred feet. They run under the sea to a great extent; so that large ships sail over the miners' heads. The stratum of coal is always inclined, or *dips* as they call it; and frequently the miners have to sink, or to rise, a hundred feet, or more, to find the remainder of a broken vein. These breaks appear to be the consequence of some violent concussion of the earth, by which the vein of coal is cast up, or down, out of the regular course; such a break is called a *dyke*.

7. One of the most remarkable coal-works was at Borrowstoness, in Scotland. The vein of coal went under an arm of the sea, till it reached a spot half a mile from the shore; this was formed into a quay, for an entrance, as coming more

1. What of coal? 2. What country particularly abounds in this substance? 4. What of New-

castle-upon-Tyne? 5. How is coal found? 6. The coal mines at Whitehaven? 7. Borrow

immediately upon the works; the coal was laid there, and shipping could come close, and take them in. Fresh water sprang from the bottom of the mine, and was pumped out, from a depth of 240 feet. It was a wonderful work, and was wrought to great advantage for many years. At last, an extraordinarily high tide rose above the mouth of the coal-pit, and drowned the whole concern, with all who were then at work in it.

8. Besides the general gloominess of working so far under ground, the miners are liable to several dangerous accidents. Foul air, which suffocates and kills; and the fire damp, which catches, if any flame comes near it, and explodes like a volcano, and burns for a long while, even for many months or years. As this foulness takes fire only from flame, a machine was invented which produced a stream of sparks, by a wheel of flints striking against steel; which glimmering light sufficed for the workmen.

9. Sir Humphrey Davy afterwards discovered, that the foul air was too thick to pass between close iron wires; he therefore invented a lamp to be enclosed in a case of wire gauze; so that although the



light passed through this wire work readily, the fire damp lodged on the outside and was perfectly harmless. This is a very important safeguard to the miners;

for the accidents have been tremendous and destructive. Yet, because the light is not so strong when enclosed in this kind of wire lantern as without, they will frequently lay the safety screen aside, at the hazard of their lives; and dreadful consequences have ensued.

10. After the coal has been brought to the surface in baskets, it must then be conveyed to the water-side for shipping. Frequently, therefore, railroads are constructed, from the mouth of the pit, to the edge of the water. These consist of grooves of wood or of iron, in which the wagon wheels move so easily, that one horse will draw as much as six without such a contrivance; and, if the slope be sufficient, the loaded wagons will run down by



themselves, till they come to the appointed place. Then, a pin opens a trap door in the bottom of the wagon, and lets the coals fall out, through a tunnel, into the ship itself. The empty wagons are drawn up another railroad, by the side of the descending one, by the weight and force of other loaded wagons, which are coming down.

11. Sometimes large barges, called *keels*, are employed to take the coals from the wagons to the ships, when the ships draw too much water to come far enough up the river, to meet the wagons.

12. *Coke* is coal burnt, or rather baked,

stone? 8. To what accidents are the miners

liable? 9. What did Sir Humphrey Davy invent?



in a sort of oven; it thus becomes charred, and will burn afterwards without smoke, but fiercely. In the burning of coke, a sort of tar arises, which is carefully preserved, and is very useful. Also, the hydrogen gas, disengaged in the process, may be caught; and when purified, it feeds the lamps which burn so brilliantly.

13. Some coal is so compact, that it is turned into toys, snuff-boxes, &c. This is called *Cannel coal*; and is found in England and different parts of Scotland.

14. Anthracite is the name of one of the most useful kinds of coal. It has been found in several European countries, but occurs in the greatest abundance in the United States, where it has become an article of great importance. This coal is inflammable with some difficulty, and burns without smell or smoke.

15. In Pennsylvania, the anthracite coal formation covers a tract of country many miles in width. Mauch Chunk, upon the Lehigh, Pottsville, at the head of the Schuylkill canal, and Wilkesbarre, upon the Susquehannah, have afforded the chief supply of coal from this region, as well as the greatest proportion consumed in the United States. Much of this coal is trans-



ported from the mines by means of railroads.

16. At Portsmouth, in Rhode Island an extensive bed of this coal exists; and a mine of anthracite has been opened at Worcester, in Massachusetts, at the head of the Blackstone canal.

17. The names given to coal are various, and are generally taken from the place where it is found. Most of the bituminous coal consumed in the eastern states, is exported from Liverpool; although considerable quantities are brought from Nova Scotia, called Pictou and Sydney coal.

## CHAP. XXV.

### GRANITE, MARBLE, &c.

#### GRANITE.

1. Granite is a very hard rough kind of stone, so called from being sprinkled over with a great many little stains, that resemble grains of sand. It is considered as the foundation rock of the globe, or that upon which all secondary rocks repose. Granite occurs in masses of vast thickness, which are commonly divided, by fissures, into blocks.

2. There are various kinds of granite, and it occurs of different degrees of hardness. In Russia may be seen immense pillars of solid granite, which have received a polish nearly equal to that which may be imparted to fine marble.

3. Granite is found abundantly distributed through New England and other parts of the United States. The most celebrated quarries in Massachusetts, are those of Chelmsford and Quincy, which have supplied the materials for the finest structures in Boston and the neighborhood.

4. The Portland stone of England is in high repute. It is sometimes called free-stone, because it works freely, cuts any

some other places where coal exists. 17. What of the names given to coal?

1. What of granite? 2. Are there various kinds

10. 11. How is the coal sometimes shipped? 12. What is coke? 13. Cannel coal? 14. What of anthracite? 15. Pennsylvania coal? 16. Mention

way, and is not apt to split, as many other stones do.

5. The Isle of Portland, as it is called, is a long narrow peninsula, on the coast of Dorsetshire. The whole slip of land is, as it were, one single rock, surrounded with a vast ledge of rocks, stretching into the sea, and making the place as impregnable as any fortification could do. Here are quarries, which have been dug for many years, and have been famous even



since the reign of James I. The finest structures are built with this stone; and it is calculated, that nine thousand tons of it are used every year. It is remarkable for its whiteness and durability. The blocks are frequently very large, and the removal of them is very difficult.

#### MARBLE.

6. Marble is a kind of stone composed chiefly of lime. It is found of a great variety of colors, and is of so hard, compact and fine a texture, as readily to take a beautiful polish.

7. The marble most esteemed by statuary is that which is brought from the island of Paros, situate in the Archipelago; this was the species of marble employed by the prince of sculptors, Praxiteles, and by Phidias, both of whom were natives of that island. The Parian marble hardens by exposure to the air, which enables it to

resist decomposition for ages. Its color is snow-white; and when polished, it has something of a waxy appearance. It receives with great accuracy the most delicate touches of the chisel.

8. Although the United States are known to be rich in marbles, hitherto very little pains have been taken to explore them. The quarries of Pennsylvania, which are distant about 20 miles from Philadelphia, afford a handsome marble. A similar variety is also quarried in Thomaston, Maine. Beautiful white marble is abundant in Massachusetts; it is extensively wrought at Lanesborough, Lenox and Stockbridge. The *verd antique* of New Haven is said to be the rarest and most beautiful marble yet discovered in the United States. The quarries, though believed to be inexhaustible, are not wrought at present.

#### SLATE.

9. Slate is a fossil or compact stone that may be split into plates. There are several varieties of this mineral, chiefly distinguished by their color, which is in general gray, intermixed with blue, green or black streaks. There are very valuable slate quarries in Maine, and other parts of the United States. The principal use of slates is in the covering of houses, for which they are well adapted. Slate is also extensively employed for the purpose of writing, after its surface has been properly smoothed.

#### SOAPSTONE.

10. Soapstone, or steatite, as it is called in science, is a substance so soft that it may be easily cut by a knife, and in most cases scratched by the nail. It is a compound of silica, magnesia, alumina, oxide of iron, and water. It is somewhat oily to the touch, and is often mixed with talc, asbestos &c. Common steatite occurs in

of this substance? 3. Where is it found? 4. 5. What of Portland stone? 6. Marble? 7. What

is the most esteemed marble? 8. What of marble in the United States? 9. What of slate?



masses or veins, or small beds. The soapstone of Springfield, in Massachusetts, and Francistown in New Hampshire, appears to be composed chiefly of talc.

11. Steatite is not susceptible of a very fine polish, but its softness and its property of becoming hard by heat, render it a useful mineral in the arts. It is employed for the hearths of furnaces, the sides of fire-places and stoves &c. It has even been used for the purpose of engraving; for being easily cut when soft, it may be made to assume any form, and afterwards rendered hard by heat. Steatite may be used in the manufacture of porcelain. It also forms the basis of some preparations of paint, and enters into the composition of the greater number of the balls which are employed for cleaning silks and woollen cloths.

#### LIME.

12. Lime is one of those earthy substances which exist in every part of the known world. It is found purest in limestone, marble, and chalk. No one of these substances is lime, but they become so when burned in a severe heat. Lime is employed principally as mortar in building, and as a manure to fertilize lands. Vast quantities of it are used for these purposes. It is also much used by tanners in the preparation of their leather; by soap-makers for dissolving the oil, and by sugar-bakers, for refining their sugar. It is likewise of some medicinal use.

13. Various parts of the United States produce lime in great abundance. It is very plentiful at Thomaston and Camden in Maine, where it is burnt in great quantities for exportation. The limestone caverns of the western states contain a profusion of this substance. Chloride of lime may be obtained from common lime by a very simple chemical process.

10. 11. Soapstone? 12. What of lime? 13. Lime in the United States?

### CHAP. XXVI.

#### WOODS.

##### OAK.

1. In point of strength, durability, and general use, oak claims precedence of all timber. More than eighty species of this tree are known, of which one half inhabit North America, either within the territory of the United States, or on the mountains of Mexico.

2. The white oak is one of the most valuable of our forest trees. It attains the height of seventy or eighty feet, with a trunk six or seven feet in diameter. It abounds in the New England States, but is most plentiful in Virginia and the middle States. Among the great variety of uses to which this wood is applied, the most important is ship-building. It is also extensively employed by the wheelwright, and is used for the hoops of sieves, whip-handles, &c. White oak timber is exported in immense quantities from the ports of the northern and middle states.

3. The European oak is said to be tougher and more lasting than that of America. The knotty oak of England, the 'unwedgeable and gnarled oak,' as Shakspeare called it, affords superior timber. England seems to have abounded in oak forests, although they have now become scarce. Oaks have been dug up in some places, buried a hundred feet deep in the earth; their branches were all on them, and the wood had become so hard that no tool could cut it.

4. The live oak is a tree of great importance to the United States. The leaves are evergreen; and the wood is admirably calculated for ship-building. Its durability surpasses that of the European oak. The live oak is found along the coast of the United States from latitude 37° to the

1. What of oak? 2. The white oak? 3. European oak? 4. The live oak? 5. The uses of oak

shores of the gulf of Mexico. Measures have been taken by government for the preservation and improvement of live oak plantations.

5. Besides the uses of oak in building either ships or houses, much use is made of every part of it. In Europe, the bark by its astringent qualities, is the main dependence of the tanner. To the dyer, the saw-dust affords the means of tinging his cloths; and the acorns fatten pigs.

#### PINE.

6. About thirty species of pine are known, of which nearly one-half inhabit North America. Norway furnishes immense quantities of this wood, and the whole country, especially the bleak mountainous parts, may be called one forest, chiefly of the fir or pine-tree.

7. Norway has some mines, but the forests afford its chief riches. Immense sums are obtained from other nations, to purchase this convenient and useful tree, in its various shapes. Some straight whole trees are useful as masts for shipping, or for beams in houses. Young straight trees



are called *balks*, and are split to make ladders. What are called *deals*, are large planks, perhaps twenty feet long, from nine inches to a foot broad, and three inches thick. If not above five inches wide, they are called *battens*.

8. The soil of Norway seems to suit the fir tribes. The seeds, scattered every where, fall into chinks and crevices in the rocks, where they appear to grow more luxuriantly than in any plainer spot. It is well it is so; otherwise, the amazing destruction which takes place in felling timber every year, must have cut up the whole country long ago. Were you to visit some of the ports of Norway, you would see such mountainous piles of deals, that you would suppose it could never all be used.

9. An immense number of saw-mills are kept in motion. The tree is brought to the saw, by machinery, and kept in its place; so that it is cut with great accuracy and expedition. Many families are employed in the different branches of this national concern; as felling the timber floating it down to the places of exportation, and sawing it out into deals.

10. Norway is much intersected with lakes, and long arms of the sea. By these assistances the timber is floated, with comparative ease, to its destination. These streams also supply the sawmills, and keep them in motion by their various falls of water.

11. Christiana is a principal port, from which the timber is exported; it is seated at the bottom of a gulf, opposite the northern point of Denmark, and is a beautiful spot in the summer time. Drontheim also has a considerable export trade in timber; this port is situated on the coast of the Northern Sea.

12. The red Canadian pine inhabits the whole of Canada from the Atlantic to the Pacific, and is also found in the northern and eastern parts of the United States. The trunk rises to the height of 70 or 80 feet, and is chiefly remarkable for its uniform size for two thirds of its length.

6. What of pine? 7. Norway? 8. The fir-trees of Norway? 9. Saw mills? 10. By what facilities is

the timber floated? 11. Christiana? 12. The red Canadian pine? 13. The yellow pine? 14. The



The wood is compact and fine-grained, rendered heavy by resinous matter, and is highly esteemed for its strength and durability. In the British provinces and in Maine, it is frequently employed in naval architecture, especially for the decks of vessels, furnishing planks free from knots, of forty feet in length. It is exported to Great Britain both from Maine and the St. Lawrence.

13. The true yellow pine is widely spread over the United States. On the south-western part of the Alleghany mountains, and the surrounding country, it enters into the composition of the forests, abounding on the most barren soil. The trunk rises to the height of fifty or sixty feet. Immense quantities are used in the building of ships, and in some districts houses are entirely constructed of it. The boards are exported to Great Britain and the West Indies.

14. The pitch pine inhabits the northern and middle sections of the Union, and does not appear to exist in the western or lower parts of the Southern States. It is most abundant along the Atlantic coast, where the soil is diversified, but generally meagre.

15. The loblolly, or old field pine is found throughout the lower parts of the Southern States. It often exceeds 80 feet in height and has a wide spreading summit. The *long-leaved* pine is, perhaps, the most important of all our forest trees. Not only does it furnish all the resin, tar, pitch and turpentine consumed in the United States, but the timber is valuable and enduring. The resinous products are of six sorts; turpentine, scrapings, spirits of turpentine, resin, tar and pitch. The two first are delivered in their natural state, but the others are modified by the agency of fire.

16. The turpentine is the sap obtained by making incisions into the trunk, and

the scrapings consist merely of the turpentine which becomes hardened before it



reaches the boxes placed to receive it. In general 3000 trees yield annually about 75 barrels of turpentine and 25 of scrapings. Nearly 100,000 barrels are exported annually to the Northern States and to Great Britain. Throughout the United States, it is employed in the manufacture of yellow soap.

17. Great quantities of spirits of turpentine are made in North Carolina, and about 20,000 gallons are exported annually to other parts of the United States, to England and to France. All the tar is made from the dead wood; and this is supposed to be the cause of its inferiority to the tar of the north of Europe, which is made from trees recently felled. Pitch is tar reduced by evaporation.

18. The white pine is the loftiest tree in the United States, and its timber is used in much greater quantities, and for a greater variety of purposes than any other. Throughout the Northern States, three fourths of the houses are almost wholly of white pine. It is also much used for masts of vessels, and much of it is exported for that purpose.

19. The persons engaged in procuring white pine lumber, after having previously ascertained where the trees abound, enter

pitch pine? 15. The loblolly? The long-leaved pine? 16. What of turpentine? Its exportation?

17. Spirits of turpentine? 18. What of the white pine? 19. The persons engaged in procuring it

the forests in the beginning of winter, and establish themselves in huts covered usually with birch bark, although the cold is frequently most intense. When the trees are felled and cut into logs, they drag them, by means of their cattle, to the nearest river, after fixing upon them a mark of property. At the breaking up of the ice, the logs float down the current till they arrive at their destination. If stripped of their bark, logs will remain uninjured for many years; otherwise they are liable to decay.

20. Maine furnishes nearly three fourths of all the white pine lumber exported from the United States; and next to Maine the shores of lake Champlain seem most to abound in it. The wood is formed into clapboards, shingles &c., which are sent in great quantities to the West Indies.

21. Pine forests are extremely liable to be frequently ravaged by fire; and it is very difficult to arrest the flames when they have once seized upon them. In some parts of France, the following method is practised with success:—If a fire break out in the forest, a second is kindled at a point directly opposite, when a current of air sets from the first to the second, which carries the flames to a common centre, leaving the surrounding woods uninjured.

#### CORK-TREE.

22. The cork-tree is a species of oak, which flourishes in Spain. There is a large wood of cork trees near the top of mount Etna, in Sicily. Indeed, in France, and in all the south of Europe, it abounds.

23. The trees must be fifteen years old, before their bark is fit to be peeled. They may then yield it six or eight years successively. The bark is cut lengthwise from the trees, from top to bottom, and all around it also. The bark is stripped from

the tree; yet the tree does not die, because the new bark, which comes every year, would push the former one off, were it not stripped in this manner. The sheets of bark are put under water, and made flat by heavy weights put on them while soaking. It is afterwards dried, and then becomes fit for use.

24. It comes over to us in broad pieces, four or five feet long, and eighteen or twenty inches wide. The cork cutters, (for it is a business by itself,) with very sharp knives, cut it into proper lengths, and round it fit for use. The best sort, which are tolerably free from veins and cracks, are soft and pliable, and are called *velvet corks*. Good cork is very compressible, being very porous; yet, by its elasticity, it swells again, and fills up the place into which it has been forced, so completely, that neither water nor air can pass through it.

25. The ancient Romans and Greeks knew the tree, and the bark was used as floats to fishermen's nets. It was used also by the ladies, as soles to keep their feet from the wet, and to raise such as wished to appear taller than their natural height. It was used sometimes to stop vessels; but not generally, for the Roman wine-vessels had larger mouths than a piece of cork could conveniently fill. Wax, clay, pitch, and gypsum, were preferred; or the upper part of the vessel was filled with oil, or honey, to prevent the air from having access to the liquor; a practice still common in Italy.

26. The invention of glass bottles brought cork into general use; their necks being small, the cork suits them, and becomes the best sort of stopper. This was not till the fifteenth century. The French cork-wood is the best we import.

20. What does Maine furnish? 21. What of the liability of pine forests to be destroyed by fire? 22. What of the cork-tree? 23. How old must the

trees be before their bark is peeled? 24. How does the cork come? 25. Was it known by the ancient Romans and Greeks? 26. By what in-



## CEDAR.

27. The cedar of mount Lebanon, mentioned in scripture, is reckoned one of the finest and largest trees in the world. Its wood is very hard, beautiful, solid, inclining to a reddish color, and incorruptible. It is used in the manufacture of black lead pencils, and affords an excellent material for posts. Many of the West India islands, particularly Jamaica, are well stored with cedars. They are likewise very plentiful in North America.

## WALNUT.

28. The common walnut is a very handsome and a very useful tree. The young trees are often made into hoops, and the wood is made into axe-handles, and a variety of agricultural instruments. The white walnut, or hickory, is a native of North America, where it grows to be a timber of considerable dimensions. It affords excellent fuel.

## CHESTNUT.

29. The chestnut-tree is met with in great abundance throughout most of the United States. It is very ornamental when growing, and it makes very good timber. Posts made of chestnut are said to be far more durable than those of oak.

## MAPLE.

30. Of the maple there are about thirty-six species, natives of various countries. Six are indigenous to Europe, about twelve to America, and the rest to various parts of Asia. The Great Maple, called also the sycamore and the plane-tree, is hardy, and grows rapidly, and to a great height. The timber is very close and compact, easily cut, and of a handsome color. As it often takes a fine polish, and bears varnishing well, it is much used for certain parts of musical instruments. Before the general introduction of pottery ware, it was the common material for bowls and

platters of all sorts; and many are still made of it.

31. The sugar maple grows plentifully in the United States; and from the sap of it, a considerable quantity of sugar is made. The method of obtaining this sugar has been already described.

## TEAK-TREE.

32. The teak-tree is a native of India. It is used in ship-building like the oak, and has some resemblance to it in its timber. It is a tree of uncommon size, and bears a hard nut. On the banks of the river Irawaddy, in the Birman empire, the teak forests are unrivalled; and they rise so far over the jungle or brushwood, by which tropical forests are usually encumbered, that they seem almost as if one forest were raised on gigantic poles over the top of another. Efforts are about to be made to raise this tree in Florida.

33. There are numerous other kinds of trees useful either for their timber or their peculiar qualities, which our limits prevent us from enumerating. In the succeeding chapter a description of the principal ornamental woods will be given.

## CHAP. XXVII.

## WOODS—CONTINUED.

## MAHOGANY.

1. The common mahogany is one of the most majestic trees in the world. In Cuba and Honduras, this tree, during a growth of two centuries, expands to such a gigantic size, throws out such massive arms, and spreads the shade of its shining green leaves over such a vast surface, that even the proudest oaks of our forest appear insignificant in comparison with it. A single log has often weighed six or seven tons, and been sold for more than one thousand dollars.

vention was cork brought into use? 27. What of cedar? 28. Walnut? 29. Chestnut? 30. Ma-

ple? 31. Sugar maple? 32. The teak-tree. 1. What of mahogany? 2. Its discovery?

2. The discovery of this beautiful timber was accidental, and its introduction into notice was slow. A physician of the name of Gibbons, who resided in London, received in 1724 a present of some mahogany planks from his brother, a West India captain. The Doctor was erecting a house, and gave the planks to the workmen, who rejected them as being too hard. The Doctor's cabinet-maker was employed to make a candle-box of it, and as he was sawing up the plank he also complained of the hardness of the timber. But when the candle-box was finished, it outshone in beauty all the Doctor's other furniture, and became an object of curiosity and exhibition. The wood was then taken into favor; and the despised mahogany became a prominent article of luxury among the rich.

3. The mahogany tree is found in great quantities on the low and woody lands, and even upon the rocks in the countries on the western shores of the Caribbean sea, about Honduras and Campeachy. It is also abundant in the islands of Cuba and Hayti, and it used to be plentiful in Jamaica, where it was of excellent quality; but most of the larger trees have been cut down.

4. The season for cutting the mahogany in Honduras usually commences about the month of August. The gangs of laborers employed in this work consist of from twenty to fifty each, but few exceed the latter number. They are composed of slaves and free persons, and each gang has one person belonging to it termed the huntsman. His chief occupation is to search the woods, or, as it is called, the bush, to find labor for the whole.

5. Accordingly, about the beginning of August, the huntsman is despatched on his important mission. He cuts his way

through the thickest of the woods to some elevated situation, and climbs the tallest tree he finds, from which he minutely surveys the surrounding country. At this season the leaves of the mahogany tree are invariably of a yellow reddish hue, and an eye accustomed to this kind of exercise can, at a great distance, discern the places where the wood is most abundant.

6. He now descends, and directs his steps to the spot which he may have selected. Having reached it with his party, the next operation is the felling of a sufficient number of trees to employ the gang during the season. The mahogany tree is commonly cut about ten or twelve feet from the ground, a stage being erected for the axe-man employed in levelling it. The trunk of the tree, from the dimensions of the wood, is generally preferred; but, for ornamental purposes, the limbs or branches are generally preferred.

7. A sufficient number of trees being felled to occupy the gang during the season, they commence cutting the roads upon which they are to be transported. This may fairly be estimated at two-thirds of the labor and expense of mahogany cutting. Each mahogany work forms in itself a small village on the banks of a river, and the nearer the trees grow to the river, the less difficulty there is in their transportation.

8. If the mahogany trees are much dispersed or scattered, the labor and extent of road-cutting are of course greatly increased. It not unfrequently occurs that miles of road and many bridges are made to a single tree, that may ultimately yield but one log. When roads are cleared of brush-wood, they still require the labor of hoes, pickaxes, and sledge-hammers, to level down the hillocks, to break the rocks, and to cut such of the remaining stumps

3. Where is it found? 4. When is the season for cutting? 5. How are the trees selected? 6.

What is then done? 7. A sufficient number of trees being felled—? 8. What of road-cutting?



as might impede the wheels that are hereafter to pass over them.

9. The roads being now in a state of readiness, which may generally be effected by the month of December, the mahogany tree is cut into logs, which are squared by means of the axe. In March, the season being dry, it is time to draw down the logs from their place of growth. A gang of forty men is generally capable of working six trucks. Each truck requires seven pair of oxen and two drivers: sixteen to cut food for the cattle, and twelve to load or put the logs on the carriages.

10. From the intense heat of the sun, the cattle, especially, would be unable to work during its influence; and, consequently the loading and carriage of the timber are performed in the night. Pieces of wood split from the trunk of the pitch-pine are used as torches by the workmen. The river-side is generally reached by the wearied drivers and cattle before the sun is at its highest power; and the logs, marked with the owner's initials, are thrown into the river.

11. About the end of May the periodical rains again commence. The torrents of water discharged from the clouds are so great as to render the roads impassable in the course of a few hours, when all trucking ceases. About the middle of June, the rivers are swollen to an immense height. The logs then float down a distance of two hundred miles, being followed by the gang in canoes, to disengage them from the branches of the overhanging trees, until they are stopped in some convenient situation at the mouth of the river. Each gang then separates its own cuttings, which are recognised by the marks on the ends of the logs, and forms them into large rafts; in this state they are brought down to the wharves of the pro-

prietors, where they are taken out of the water, and smoothed on their sides by the axe. The ends, which frequently get split and rent by being dashed against rocks in the river, are also sawed off. They are now ready for shipping. Belize is the principal port for this purpose.

#### BOX-WOOD.

12. The box-tree is a native of all the middle and southern parts of Europe. It is a shrubby evergreen, twelve or fifteen feet high, and with bright, myrtle-shaped leaves. It has been remarked that this tree was formerly so common in several parts of England as to have given name to several places, particularly to Boxhill in Surry, and Boxley in Kent; and in 1815, there were cut down at Boxhill, as many trees of this sort as produced upwards of £10,000. This tree was much admired by the ancient Romans, and has been much cultivated, in latter times, on account of its being easily clipped into the forms of animals and other fantastic shapes.

13. The wood is of a yellowish color, closely grained, very hard and heavy, and admits of a beautiful polish. On these accounts, it is much used by turners, by engravers on wood, carvers, and mathematical instrument makers. Flutes and other wind instruments are formed of it; and furniture made of box-wood, would be valuable were it not too heavy, as it would not only be very beautiful, but its better quality would secure it from the attacks of insects. In France it is in much demand for combs, knife handles and button moulds: and it has been stated that the quantity annually sent from Spain to Paris is alone estimated at more than ten thousand livres. An oil distilled from the shavings of box-wood has been found to relieve the tooth-ache, and to be useful in

9. How is the mahogany transported? 10. When is the operation of loading performed? 11. What of the swelling of the rivers? 12. What of box-wood? 13. Its color &c.? 14. What of engrav-

other complaints: and the powdered leaves destroy worms.

14. There is one purpose for which box, and box alone, is properly adapted, and that is the forming of wood cuts, for illustrations in books. These reduce the price considerably in the first engraving, and also in the printing; while the wood-cut in box admits of as fine and sharp a finish as any metal, and takes the ink much better. It is remarkably durable too; for, if the cut be not exposed to alternate moisture or heat, so as to warp or crush it, the numbers of thousands that it will print is almost incredible. The illustrations of this book are engravings on box-wood.

#### EBONY.

15. Ebony-wood is brought from the Indies. It is exceedingly hard and heavy, susceptible of a very fine polish, and on that account used in mosaic and inlaid works. There are many kinds of ebony: the most usual are black, red, and green. Black ebony is much preferred to that of any other color. It is now much less used than formerly; since the discovery of so many ways of imparting to other woods a black color.

#### LIGNUMVITAE.

16. The *Lignumvitae* of commerce is a dark-looking evergreen, and grows to a great size in the West India islands, of which it is a native. It is a very hardy tree, and retains its greenness in the dryest weather. It strikes its root deep into the ground, and thus defies the hurricane as well as the drought. The bark is hard, smooth and brittle; and the wood is of a yellowish, or, rather, olive color.

17. *Lignumvitae* is the weightiest timber with which we are acquainted, and it is the most difficult to work. It can hardly be split, but breaks into pieces like a stone or crystallized metal. It is full of

resinous juice, which prevents oil or water from working into it; and it is, therefore proof against decay. Its weight and hardness make it the very best timber for stampers and mallets of all sorts; and its resinous matter fits it the best for the sheaves or pulleys of blocks, and for friction rollers and castors.

18. When full grown, the largest *lignumvitae* trees are from forty to fifty feet in height, and from fourteen to eighteen inches in diameter. The resin of the *lignumvitae*, *Gum Guaicum* of the shops, may be obtained by tapping the live tree, and also by boiling the chips and sawdust of the wood. It is aromatic, slightly bitter, and prescribed in chronic rheumatism and other diseases.

#### ROSEWOOD, &c.

19. The wood most in use for cabinet works, next to mahogany is rosewood. The name of this species of wood is derived from its fragrance; and it has long been known to cabinet-makers. It was first introduced, it is said, from the island of Cyprus; though the great supply now comes from Brazil. The width of the logs imported into this country averages twenty-two inches, so that it must be the produce of a considerable tree. The wood is usually cut into veneers of nine to an inch; and is employed in this way for all the larger furniture, such as tables; but solid for the legs of chairs, tables and cabinets.

20. There are many other varieties of fancy wood, as the calamander wood of the island of Ceylon, zebra wood, sandal wood, satin wood, Coromandel wood &c. These are less used than those which we have described, but perhaps they are not much inferior to them in beauty. Brazil furnishes an endless variety of useful and ornamental wood.

ing on wood? 15. What of ebony? 16. *Lignumvitæ*? 17. Its weight? 18. Of what size is it when

full grown? What is gum guaicum? 19. Rose wood? 20. What of other kinds of wood?



## CHAP. XXVIII.

## DRUGS, MEDICINES, DYE-STUFFS &amp;c.

## LOGWOOD.

1. This is the wood of a tree, a native of America, and which attains the greatest perfection at Campeachy and in the West Indies. The tree grows very high. Its seeds are known by the name of Jamaica pepper or allspice. Logwood is so heavy as to sink in water: it is hard, compact, of a fine grain, capable of being polished, and scarcely susceptible of decay.

2. The chief use of logwood is for dying. For this purpose its juice, as it is commonly called, may be extracted by decoction with water. Alcohol extracts it more readily and copiously than water. The color of its dyes is a fine red, inclining a little to violet or purple. Acids turn it yellow: alkalies deepen its color. Logwood is an article of great commercial importance. It is imported in logs, which are afterwards chipped.

## BRAZIL-WOOD.

3. This wood is so called from the province whence it was brought; although it has been contested that the name and the wood were common before the discovery of America, and that the province received its name from the wood. The tree is large, crooked and knotty. The leaves are of a beautiful red, and exhale an agreeable odor. The principal use of the wood is in dying red; and though the color is liable to decay, yet, by mixing it with alum and tartar, it is easily made permanent. There is also made of it, by means of acids, a sort of liquid lake or carmine, for painting in miniature.

## FUSTIC.

4. Fustic is the wood of a species of mulberry, growing in most parts of South America, in the United States, and the West India islands. It is a large and

handsome tree; and the timber, though like most other dye-woods, brittle, is hard and close-grained. It is very extensively used as an ingredient in the dying of yellow, and is largely imported for that purpose.

## ANNOTTO.

5. Annotto, or Arnatto, is a kind of buff-colored dye, which has acquired with us the name of *Nankeen*, from Nanking in China, whence the calico so colored first came. It is procured from the seed capsules of the *Bixa*, a tree of South America. The seeds are contained in a pod similar to a chestnut. This article is extensively used in dying and painting.

## COCHINEAL.

6. Cochineal is found in Mexico, Georgia, South Carolina, and some of the West India islands, but it is in Mexico only that it is reared with care and forms an important article of commerce. It is a small insect, seldom exceeding the size of a grain of barley; and was generally believed, for a considerable time after it began to be imported into Europe, to be a sort of vegetable grain or seed. It is principally used in the dying of scarlet, crimson, and other bright colors. It is imported in bags, each containing about 200 lbs.

7. The two sexes of this insect are exceedingly dissimilar in their appearance. The female, which alone is valuable for its color, is ill-shaped, awkward and stupid. The male is very scarce, and one is sufficient for 300 females. It is small, slender and active in comparison with the female.

8. The cochineal insect may, in some respects, be compared to the silk-worm, particularly in the manner of depositing its eggs. The insects destined for this purpose are taken at a proper time of their growth, and put into a box well closed, and lined with a coarse cloth, lest any of them should be lost; and in this confine-

wood? 4. Fustic? 5. Annotto? From what is

1. What of logwood? 2. Its use? 3. Brazil

ment they lay their eggs and die. At Oaxaca, cochineal insects are gathered in large quantities, and form an extensive branch of commerce; the cultivation of these little creatures being there the chief employment of the Indians. Cochineal is sometimes used in medicine.

### INDIGO.

9. Indigo is the drug which yields the beautiful dye of that name. It is obtained from certain tropical plants, which are cultivated both in India and America. It is probable that the culture of the indigo plant has been practised in India from a remote period. As it is found in commerce, indigo presents the form of little square or oblong cakes, of a deep blue color. It is brittle, rather light, and without taste or odor. Sulphuric acid is the only single agent that dissolves indigo without destroying its color.

10. The indigo plant requires a light, rich soil, and a warm exposure. It succeeds best on newly cleared lands, on account of their moisture. The seed, which, as to figure and color, resembles gunpowder, is sown in little furrows, at a foot distant from each other. Though it may be sown in all seasons, the spring is commonly preferred. When the plant has been cut down, it is placed in layers in a large wooden vessel, and covered with water. In this situation it cannot remain long in warm climates without undergoing some change. A blue sediment is finally obtained in this manner, which when dried is formed into small lumps, and packed for exportation.

11. The value of the indigo consumed in the United States in 1829, was estimated at two millions of dollars. Of this, about one tenth part only, or 200,000 pounds was raised in the country. It is computed that British India supplies three

fourths of all the indigo brought into European markets.

### MADDER.

12. Madder is the root of a plant of which there are several varieties. It is very much used in dying red; and though the color which it imparts be less bright and beautiful than that of cochineal, it has the advantage of being cheaper and more durable. It is a native of the South of Europe, Asia Minor, and India.

### BARILLA.

13. Barilla is the name of a sea-plant which grows very plentifully on the coast of Spain. It abounds with soda; and the impure ashes of the plant, containing that salt in great abundance, form an important article of commerce. The ashes themselves are commonly called barilla.

### GUM ARABIC.

14. This gum exudes from the Egyptian acacia or thorn-tree, whose fruit affords the inspissated juice of that name. It is brought to this country principally from the Levant. It is employed by dyers, calico-printers &c., and is of some use in medicine.

### ASSA-FOETIDA.

15. This substance is brought in large masses from Persia and the East Indies. It is a compact, gummy, resinous substance, and soft and pliable like wax when new. It smells like garlic, but much stronger, and has a bitter, biting taste. It is used in medicine as a powerful stimulant, particularly of the nervous system.

### COPAL.

16. This gum-resin is obtained from a tree, which is a native of North America. It is transparent, and of a bright brown color. It forms an excellent varnish, which, when properly applied and slowly dried, is very hard and durable. It is applied to snuff boxes, tea-boards, &c.

it procured? Its use? 6. Where is cochineal found? 9. What of Indigo? 10. What of its cul-

ture? 11. What of the quantity consumed in the United States? 12. What of madder? 13. Ba



## CAOUTCHOUC.

17. This substance, usually termed *Indian rubber*, is prepared from the juice of a tree growing in Cayenne, and other parts of South America. The trunk of the tree is wounded by a sharp instrument, and the juice which flows from it applied in successive coatings on a mould of clay, and dried by the fire or the sun. When it is of a sufficient thickness, the mould is removed.

18. Besides its use for removing the marks of black lead from paper, it is now employed in the manufacture of shoes, surgical instruments and a variety of other articles. India rubber shoes are exported from Para in South America, and have become a very important article of commerce. This valuable product was first made known to Europeans in 1736. Various attempts have been made to transport it to Europe in its fluid state, but without success. Its application to the arts is various, but, until recently, no advantage has been taken of one of its most remarkable properties, its elasticity. Two ingenious chemists of Paris, by a new process, have succeeded in spinning it into threads of various sizes, and it is now woven into suspenders, garters, surgical bandages for ruptures, fractured or dislocated limbs.

## GAMBOGE.

19. Gamboge is a resinous gum of a firm and compact texture, and of a beautiful yellow color. It is chiefly brought from Cambaja, or Cambogia, in the East Indies, whence it has obtained its name. The best sort is of a deep yellow or orange color. It has no smell and very little taste. It is used in medicine as a strong purgative, but its principal use is as a pigment in water colors, though it does not stand.

rilla? 14. Gum Arabic? 15. Assa-foetida? 16. Copal? 17. Caoutchouc? 18. Its uses? 19. What

## GUM-LAC.

20. Lac or gum-lac is the produce of an insect, which deposits its eggs on the branches of a tree called Bihar, in Assam, and elsewhere in India. Lac possesses the properties of a resin, and is the basis of many varnishes, and of the finest kinds of sealing-wax. It is used in painting, and imparts a fine red color to silk and cotton. In India, lac is formed into rings, beads, and other trinkets.

## MYRRH.

21. Myrrh is brought from the East Indies, and likewise from Alexandria, Smyrna, and Aleppo. It is hard, dry, glossy, and of various colors, and is the produce of a tree, of which very little is known. Myrrh has a peculiar and rather fragrant odor, and a bitter aromatic taste. It is used chiefly in medicine.

## TRAGACANTH.

22. Tragacanth is obtained from a small plant of the same name growing in Syria and other eastern parts. It is brought to us chiefly from Turkey. It is usually dearer than other gums. This article is of great use in medicine. Skinners and carriers likewise use considerable quantities of it in the preparation of their leather.

## CAMPHOR.

23. Camphor, as we have it, looks something like white sugar-candy. It is of the nature of rosin. It tastes very bitter; and will not dissolve in water, but only in spirits of wine.

24. The camphor tree is a species of laurel, which grows in the East Indies chiefly in the islands of Borneo and Ceylon. It is procured by distillation, in Japan. Great quantities are used in medicine; and Eastern princes burn it, as it is very inflammable, gives a great light, and yields a considerable degree of fragrance.

of gamboge? 20. Gum-lac? 21. Myrrh? 22. Tragacanth? 23 24. Camphor? 25. How is it ob

25. Camphor is imported in chests, drums and casks. When pure, it has a strong, fragrant, penetrating odor, and a bitter, pungent, aromatic taste. Camphor is obtained in Sumatra in concrete masses from the heart of the tree; but not above one tree in three hundred contains this valuable substance, which is daily becoming scarcer. China and Japan camphor is obtained by boiling the roots and smaller branches of the tree, cut into small pieces, in large iron kettles, on the top of which the camphor rises. When refined, camphor is in thin hollow cakes of a virgin whiteness, and, if exposed to the air, totally evaporates. It is so inflammable as to preserve its flame in water.

#### OPIUM.

26. Opium is obtained from the white poppy, a plant which is cultivated in great abundance in India and other parts of the East. The poppy is planted in a fertile soil and well watered. When at its full growth an incision is made in the top of the plant, from which there issues a white milky juice, which soon hardens, and is scraped off the plants, and wrought into cakes. In this state it is exported. Opium thus prepared is a tough, brown substance, has a peculiar smell, and a bitter taste. It burns very readily when held to a flame.

27. The Turkish opium is in most esteem, and large quantities of it are exported to China. An excessive fondness for opium prevails in all parts of Turkey, and the East Indies. In vain have the laws of China condemned to the flames every vessel that imports, and every house that receives it; its use is not less considerable. It is still greater at Malacca, Borneo, Sumatra &c. These islanders smoke it with their tobacco: those who are desirous of attempting some desperate action intoxicate themselves with the fume. The

Turks, likewise, smoke and chew opium just before they go into battle.

28. The effects of opium on those who are accustomed to take it in considerable quantities, are highly exhilarating. It produces a kind of pleasing delirium, in which the imagination is vividly employed in contemplating the most delightful images, and forming the most extravagant combinations of ideas. But the depression which ensues, when its effects have subsided, is proportionally great. The ill consequences which arise from the use of opium are more serious than those from the immoderate drinking of wine. The most dreadful nervous irritation and debility are experienced, and the strength of the body, and the powers of the mind are soon destroyed. Laudanum, a powerful poison, is obtained from opium.

#### GINSENG.

29. The root of this plant has been celebrated for a long time among the Chinese; and indeed so highly is it prized as to have received the appellations of "pure spirit of the earth," and "plant that gives immortality." Volumes have been written on its virtues, and recourse is had to it in every difficulty. The plant is said to be a native of Tartary, growing wild in a mountainous and wooded region, where it is collected with many precautions by the Chinese and Tartars, at the commencement of spring and in the latter part of autumn, and is so rare as to bring three times its weight in silver. An early traveller relates that the emperor of China employed, in one year, 10,000 Tartars in procuring this root. From China it was imported into Japan, where it was obtained by the Dutch, who first brought it to Europe.

30. Notwithstanding the extravagant price and high reputation of ginseng in China, it appears to be, really, a plant

tained? 26. What of opium? 27. Turkish opium? 28. Its effects? 29. What of ginseng? 30. Does



of very little efficacy; the taste is sweet and mucilaginous, accompanied with some bitterness, and also slightly aromatic. The same plant inhabits the United States, chiefly in the vicinity or upon the Alleghany mountains, and has been exported to China in such quantities as to reduce the price very much.

#### LIQUORICE.

31. This root grows wild in many parts of France, Italy, Spain, and Germany. The plant which affords liquorice-root seldom exceeds a foot in height; its leaves are of a dark glossy green color; the blossoms are red, and produce small pods, which contain the seed. The inspissated juice of the common liquorice-root is brought to us in rolls, or cakes, usually covered with bay-leaves, from Spain and Holland. Refined liquorice, or that description of the article which is vended in thin, rounded, and glazed pieces, about the thickness of a crow's quill, is prepared in England and in this country. The whole process consists in evaporating the liquorice-ball anew, and purifying it with the help of isinglass &c.

#### RHUBARB.

32. There are several species of the rhubarb-plant. Two sorts of rhubarb are met with in the shops. The first is imported from Turkey and Russia. The other, which is less esteemed, comes immediately from the East Indies. The mountains of Thibet abound with rhubarb; and it is produced in great abundance on the confines of China and Tartary. Rhubarb is much used in medicine. Its yellow color is remarkably less destructible than any other vegetable yellows.

#### MANNA.

33. Several vegetables afford manna. It is extracted from the pine, the fir, the maple, the oak, the fig, the olive, and a

variety of other trees; but the ash, the larch, and the alhagi afford it in the largest quantities. The ash which affords manna grows naturally in all temperate climates; but Calabria and Sicily appear to be the most congenial countries to this tree; or at least, it is only in these countries that it abundantly furnishes the juice called manna in commerce.

34. The manna flows naturally from this tree, and attaches itself to its sides in the form of white transparent drops; but incisions are made in the tree in summer to facilitate the extraction. The manna flows through these apertures upon the trunk of the tree, from whence it is detached with wooden instruments. The *alhagi* is a tree which grows in Persia. A juice transudes from its leaves in the form of drops of various sizes, which the sun hardens. The manna most frequently used is that which is brought from Calabria. The best sort of manna comes from Sicily.

#### ALUM.

35. Alum is a mineral substance composed of a peculiar earth termed *alumine* and sulphuric acid. Alum is sometimes found native, but by far the greater part of that which is met with in commerce is artificially prepared. The best alum is that which is made in Italy. It is shipped in considerable quantities from Smyrna, and some is brought from England. The principal use of alum is in the process of dying—as it gives permanency to colors which otherwise would not adhere at all, or but for a very short time. It is also used in medicine, and for a variety of purposes. The ancients are supposed to have been unacquainted with alum. It was first discovered by the Orientals, who established alum works in Syria in the thirteenth or fourteenth century.

it grow in the United States? 31. What of liquorice? 32. Rhubarb? 33. 34. What of manna?

35 Alum? For what is it used? Was it known by the ancients?

# CHAP. XXIX.

## WHALE FISHERY.

1. The whale is the largest fish that swims, of which we have any certain knowledge. Those which are now found do not seem to rise to the vast dimensions of which we read in former times, when they have been found ninety, and even a hundred feet long. It is rather a clumsy fish, for its head is one third of its whole size.

2. The whale has, in the upper part of its head, two openings from its mouth. Through these it spouts out water, as if for its amusement; though often to its ruin, as the whalers discern by that whereabouts the fish are swimming. This water is spouted out not only in great quantities, but frequently with a thundering noise. Its eyes seem very small; not larger than those of a bull.

3. It does not seem fond of our warmer climates. It rather chooses the cold regions of the poles, both northern and southern. There, for ages, it played about



undisturbed; but of later years it has been much interrupted in its sports.

4. So early as the time of Alfred, the people of Norway had begun to catch whales. But this knowledge seems to have been lost or useless, for seven hun-

dred years. The people of Biscay, a province of Spain, were eminent in this fishery, and first followed the whales into their Polar recesses. They were once common in the ocean, before they were hunted thus. So that, in the time of Elizabeth, when the English began to prosecute that business, it was advised to procure from 'Biscaye men skilful in catching the whale, and orderinge of the oyle.'

5. The oil indeed was the only material sought by the English for a long time. But a vessel which had been unsuccessfully endeavoring to fish near Cape Breton, in North America, met with the remains of a ship of Biscay, which had been wrecked on that coast the year before; and on board were found eight hundred pieces of whalebone, which were brought home. This was the first time any of that commodity appeared in England.

6. The jaw-bones of the whale are very large; a foot thick, and fifteen or twenty feet long: they are sometimes set up as gate posts: but what is called *whalebone*, is not the bones of the whale, but rather some very large gristly substances which it has inside its mouth, by means of which it strains off the snails it feeds upon, so that when it forces out the water, it still retains them. Instead of teeth, the whale has five hundred horny substances, laminated, or formed of thin plates laid one over another. These are attached to the upper jaw, and make a sort of cage of the mouth. Some of them are five feet long, ending in fine hairs; and they diminish in size, till some are quite small.

7. The skin of the whale is not covered with scales; it is an inch thick, and under it is a lining of fat, called *blubber*, almost half a yard thick. In so large a creature, this makes a vast quantity; a single whale

1. 2. 3. What of the whale? 4. When did people begin to catch whales? 5. When were

they caught for their bones? 6. What of whalebone? 7. The skin of the whale? Blub-



yielding sometimes a hundred and fifty tons of oil.

8. The flesh of the whale is eaten by the Greenlanders, either raw or baked, or dried in the sun. The skin, the tail, and the fins, are accounted delicacies without any cooking. The intestines are formed into a transparent skin, for their windows; and the tendons are split into threads, for twine for their nets, or for sewing.

9. It may be supposed, that the catching of a creature of such an enormous bulk, must be attended with considerable hazard. When a whale is angry, it will sometimes dash the boat and all in it to destruction, with one stroke of its huge tail. The ship itself is hardly able to resist its fury, when attacked by it. In some cases, the mariners throw out an empty barrel to the enraged animal: if the whale attacks this, the boats row away in safety; while he teases himself, in beating about this supposed enemy.

10. Every ship carries with it six boats, with hands enough to put a harpooner and six men into each. When they come to that part of the sea where they expect to find the fish, they keep two boats constantly on the watch, and the others in readiness. When one of these watching boats descries a whale, they both row af-



ter it. The harpooner who first comes near enough, darts his harpoon into it,

ter? 8. The flesh? 9—12. The whale fishery?

with all his force. As soon as a whale is struck, an oar is set upright in the boat, as a signal; and immediately all the others row thither, to assist in securing the prize.

11. To the harpoon is attached a long line, so coiled up as to run out without hindrance. Should it get entangled with the boat, the boat would be dragged under water instantly; for the wounded fish swims off with great rapidity, and often dives in a perpendicular direction. To prevent such a danger, one man stands over the line, as it passes the edge of the boat, with a hatchet raised ready to strike, that he might cut the rope in an instant. Indeed, the velocity of the creature is so great, that the men continually wet the edge of the boat where the line runs, lest it should, by the intense friction, catch fire.

12. The whale cannot continue immersed in the water for any great length of time; he must come up to breathe. When they see him rising, they row after him, and strike him with another harpoon, in order to ensure and expedite his dying. Becoming exhausted, he cannot now continue under water so long as before; and when he comes up again, he is little able to make a third descent. The boats therefore gather around him, and the men kill him with long lances.

13. The harpoon is a long staff, at one end of which is a ring for the line, at the other a triangular iron, or sharp barbed spear-head, for penetrating deeply into the creature's body. An instrument more effectual, and which is now coming into use, is the gun harpoon; a contrivance for darting the instrument from a blunderbuss, or swivel gun. This will effect the purpose more certainly, and at a greater distance. This also is more merciful; as, by entering more deeply, the fish is killed at once, or does not live above a quarter

13. Describe the harpoon. The gunharpoon

of an hour. He is known to be near dying, when the water he spouts out becomes tinged with blood.

14. When they have conquered him, he is fastened with ropes to the side of the ship, and the men begin, standing upon him, to cut out his fat, in large lumps; and to cut off, with hatchets, the whalebone from his upper jaw. The substance of the carcass they leave for the bears or birds of prey. A fish so obtained will be worth a thousand pounds, or less, according to its size; and produces about seven-ay butts of blubber.

15. These fish, at first, came into all the bays, and shallower arms of the sea; but having been so much disturbed, they now frequent only the deeper waters. Davis's Straits seem of late to be their favorite haunt. Yet in November, they are found in great numbers about the mouth of the river St. Lawrence to which the females retire to bring forth their young.

16. Another product of the whale is *Spermaceti*. There is one species of whale so named, because it yields this matter in greater abundance. This is a white, flaky, half-greasy substance, of much use in medicine, for its oily qualities. Taken inwardly, it softens and lubricates; and by the same qualities, when used externally, it renders the skin soft and delicate. The ladies use it in their cosmetics; and excellent candles are made of it.

17. The real nature of spermaceti was not known for a long time; but it is now agreed to be the brain of the whale; some tons are yielded by a single fish. This is cut, and melted, and strained repeatedly; by which means it becomes delicately white.

18. Something like it may be manufactured from whale oil, and the coarser parts

of the fish, as the tail, &c. But this is not so good, nor will it keep its color.

19. Another substance, having been found in the bowels of the whale, is supposed to be an animal concretion; this is *Ambergris*; valued chiefly as a perfume, although the Asiatics use it as a spice, to flavor their dishes. It has often been found floating in the sea, and its true source was not known till lately. It is chiefly in the spermaceti whale that it has been met with. One lucky fisherman found in a whale a mass so large and fine, that he sold it for five hundred pounds.

20. Although Greenland, and its neighboring seas in the North, have been frequented most for whale catching, yet these fishes have been discovered in the Antarctic seas; and the Southern whale fishery has proved very lucrative; although the distance being greater, it becomes a much longer and more expensive voyage. The season in the Northern seas is in May, June, and July; and, whether successful or not, the ships must come away by August, or they would be frozen up in the ice.

21. Man is the greatest enemy the whale has; yet he has others. The black spermaceti whale attacks and tears to pieces the smaller white whales. The unicorn fish never meets the great whale without a battle. The white bear sits on the ice watching his movements, and, plunging after him, by repeated wounds overcomes the unwieldy prize. Sometimes two or more saw-fish attack the whale. The only weapon the whale has is its tail; if he can strike his enemy with that, he dashes him to pieces. The saw-fish very nimbly avoids this by bounding out of the water, and, returning, strikes his saw into the back of the whale.

22. In 1822, two boats belonging to the ship Baffin went in pursuit of a whale.

15—17. What of spermaceti? 18. Ambergris?

19. The southern whale-fishery? 20. The ens.



John Carr was harpooner and commander of one of them. The whale they pursued led them into a vast shoal of his own species; they were so numerous that their blowing was incessant, and they believed that they did not see fewer than an hundred. Fearful of alarming them without striking any, they remained for awhile motionless. At last, one rose near Carr's boat, and he approached, and fatally for himself, harpooned it. When he struck, the fish was approaching the boat; and, passing very rapidly, jerked the line out of its place over the stern, and threw it upon the gunwale. Its pressure in this unfavorable position so careened the boat, that the side was pulled under water, and it began to fill.

23. In this emergency, Carr, who was a brave, active man, siezed the line, and endeavored to relieve the boat by restoring it to its place; but, by some circumstance which was never accounted for, a turn of the line flew over his arm, dragged him overboard in an instant, and drew him under the water, never more to rise. So sudden was the accident, that only one man, who was watching him, saw what had happened; so that when the boat righted, which it immediately did, though half full of water, the whole crew on looking round inquired what had become of Carr.

24. It is impossible to imagine a death more awfully sudden and unexpected. The invisible bullet could not have effected more instantaneous destruction. The velocity of the whale at its first descent is from thirteen to fifteen feet per second. Now as this unfortunate man was adjusting the line at the water's very edge, where it must have been perfectly tight, owing to its obstruction in running out of the boat, the interval between the fastening the line about him and his disappearance

could not have exceeded the third part of a second of time, for in one second only he must have been dragged ten or twelve feet deep. Indeed he had not time for the least exclamation; and the person who saw his removal, observed that it was so exceeding quick, that though his eye was upon him at the moment, he could scarcely distinguish his figure as he disappeared.

25. A harpooner once succeeded in striking a whale, at the distance of three hundred and fifty yards. It dragged out ten lines, (2400 yards,) and was supposed to be seen blowing in different holes in the ice. After some time it made its appearance on the exterior, and was again struck, at the moment it was about to go under the second time. About an hundred yards from the edge, it broke the ice where it was a foot thick, with its head, and respired through the opening. It then pushed forward, breaking the ice as it advanced, in spite of the lances constantly directed against it. At last it reached a kind of basin in the field, where it floated on the surface without any incumbrance from ice.

26. Its back being fairly exposed, the harpoon struck from the boat on the outside, was observed to be so slightly entangled, that it was ready to drop out. Some of the officers lamented this circumstance, and wished that the harpoon might be better *fast*; at the same time observing that if it should slip out, either the fish would be lost, or they would be under the necessity of flinching it where it lay, and of dragging the blubber over the ice to the ship; a kind and degree of labor every one was anxious to avoid.

27. No sooner was the wish expressed and its importance explained, than a young and daring sailor stepped forward, and offered to strike the harpoon deeper. Not

mies of the whale? 21—23. Carr's adventure?

24—27. The sailor who jumped on a whale's

at all intimidated by the surprise manifested on every countenance at such a bold proposal, he leaped on the back of the living whale, and cut the harpoon out with his pocket knife. Stimulated by his gallant example, one of his companions proceeded to his assistance. While one of them hauled upon the line and held it in his hands, the other set his shoulder against the end of the harpoon, and though it was without a stock, contrived to strike it again into the fish more effectually than at first!

28. The whale was in motion before they had finished. After they got off its back, it advanced a considerable distance, breaking the ice all the way, and survived this novel treatment ten or fifteen minutes. This daring deed was of essential service. The whale fortunately sunk spontaneously after it expired; on which it was hauled out under the ice by the line and secured without farther trouble. It proved a mighty whale; a very considerable prize.

29. Captain Lyons while prosecuting the whale-fishery on the Labrador coast, in the season of 1802, discovered a large whale at a short distance from the ship. Four boats were despatched in pursuit, and two of them succeeded in approaching it so closely together, that two harpoons were struck at the same moment. The fish descended a few fathoms in the direction of another of the boats, which was on the advance, rose accidentally beneath it, struck it with its head, and threw the boat, men, and apparatus, about fifteen feet into the air. It was inverted by the stroke, and fell into the water with its keel upwards. All the people were picked up alive by the fourth boat, which was just at hand, excepting one man, who having got entangled in the boat, fell beneath it, and was unfortunately drowned.

30. The whale-fishery is an important branch of American industry and enterprise. Notwithstanding the imposing dangers and severe hardships which it involves, there are many who become attached to the pursuit. The inhabitants of Nantucket are extensively engaged in the whale-fishery, and their ships penetrate to the most distant seas on the globe. The town of New Bedford also sends forth many vessels in pursuit of the whale. It employs more than 40,000 tons of shipping in the business.

### CHAP. XXX.

#### MISCELLANEOUS PRODUCTIONS.

##### TOBACCO.

1. Our first knowledge of this plant, now so valuable, was through the Spaniards, about the year 1560. They brought it from Tabaco, in the province of Yucatan, from which place it obtains its name. Sir Walter Raleigh introduced it into England. The first time he smoked it was in private; he had called his servant for a jug of water; when the man brought it in, he saw the smoke coming out of his master's mouth, and naturally supposing he was on fire, he as naturally threw the jug of water over him, to put it out.

2. Virginia has been famous for the successful cultivation of the tobacco-plant. It has become the staple of the province; though it is said to be now giving way to a much wider cultivation of wheat. The tobacco-plant, when full grown, will rise to six feet in height. The stem is pretty straight, rather hairy and clammy. The leaves are of considerable length, of a yellow green; those nearest the ground are the largest, but they make the coarsest tobacco.

3. As the plants grow, they require

back? 23. The boat upset by a whale? 29. What of the American whale fishery? 30. What places

in the U. States are extensively engaged in it? 1. What of tobacco? 2—4. Describe the plant



much attention, to keep the ground between the rows clear from weeds; and to pull off all the lowest and coarsest leaves from the plant itself, in order to feed more



fully the upper ones. This laborious work is done by negro slaves. When the leaf turns brown, the plant is ripe. The plants, as they ripen, are cut down, and are laid in a heap to heat; after which they are hung up separately to dry, in houses built on purpose.

4. When thus prepared, the leaves are stripped off the stalks, and sorted out; the finer ones, or those growing towards the top, being kept by themselves. They are then packed up in hogsheads, and shipped off for Europe. The lands, however fertile, are soon impoverished by the plant. Virginia has, in some years, exported seventy thousand hogsheads of tobacco.

5. Cuba is celebrated for its tobacco, particularly its cigars. These consist of the leaves formed into small rolls for the purpose of smoking. Havannah cigars are usually reckoned the best. Recently, the exportation of cigars from Cuba is said to have amounted to 200,000 boxes a year. The tobacco used in Cuba by the lower classes is chiefly imported from the United States.

6. In some countries, as England, tobacco is principally used in the form of snuff; in others it is principally chewed;

and its culture. 5. What of Cuba tobacco? The

but in one form or other it is every where made use of. So early as 1624, Pope Urban VIII. issued a bull excommunicating those who smoked in churches. In Spain, France, and Germany, in Holland, Sweden, Denmark, and Russia, the practice of smoking tobacco prevails among the rich and poor, the learned and the gay. In our own country, smoking is often carried to excess. The effects of this practice are often highly injurious, and the longer a person refrains from it the better.

7. For a long time smoking was forbidden in many parts of New England under severe penalties. In Russia it was prohibited under pain of having the nose cut off. James the First, king of England, did not think it beneath the royal dignity to take up his pen upon the subject. He accordingly in 1603, published his famous 'Counterblaste to Tobacco,' in which the following remarkable passage occurs:—"It is a custom loathesome to the eye, hateful to the nose, harmful to the brain, dangerous to the lungs, and in the black fume thereof nearest resembling the horrible Stygian smoke of the pit that is bottomless."

#### HEMP.

8. Hemp is a valuable plant which grows wild in the East Indies and some parts of America. In the United States, the hemp has become naturalized in many spots, and is common in waste places along road-sides &c. Though cultivated to some extent in the United States, it still forms a large article of import from Europe, and particularly from Russia.

9. Only the coarser kinds of hemp are employed in making cordage; the better sorts being used for linen, which, though it can never be made so fine as that from flax, is yet much stronger, and equally susceptible of bleaching. Cloths made of hemp have also this property, that their

uses of tobacco? 7. The prohibitions of its use?

color improves by wearing, while that of flax linen decays.

10. The hemp plant, grows usually to the height of from five to six feet. It is sown in April, and becomes fit for gathering in, after harvest. It bears a blue flower, and the plant is valuable both for its seeds, which are given to birds kept in cages, as also for its bark, which, when properly treated, becomes a tissue of tough long fibres; of which thread, twine, cordage, and huge ropes, are made.

11. When the hemp-seed is ripe, is the proper time to gather the plants; which is done by plucking them up by the roots, in small bundles. When the plants have been sufficiently dried, they are threshed with a flail, to loosen the rind in some degree. There is an outward husk, which, being of no use, is cleaned off. Then the whole plant is put into water to soak, till the proper bark begins to separate from the stem. It is then taken out, cut into suitable lengths, and dried. The fibrous bark becoming a parcel of strings.

12. It must now be reduced into tow. This is done by a sort of combing, which is called hackling. The comb in this case consists of several rows of strong steel pins, eight or nine inches long. This is fixed on the bench. A handful of these fibres is struck among the pins, and drawn out quickly, first one end of them, then the other. This is often repeated, and repeated with hackling pins still finer and closer; till the whole is brought into its separate threads. In this mass of regular, distinct, and slender threads, it is called tow.

13. The tow is then spun into threads, finer or coarser, according to the work for which it is intended. If intended for fine work, as cloth for shirts, &c. the operation is much the same as for flax.

14. In spinning tow for twine, or cordage, the workman winds a wisp of it round his waist; so as the two ends of it may meet before him. With the fingers of the left hand, he unites a few of these two ends of tow together, and with the thumb and finger of the right hand, he draws out a sort of thread from these united ends, and slightly twists it. On the adroitness of his right hand much depends. But the principal operation of the twisting is performed by a wheel which is turned very fast: this turns a hook, which is made to revolve with considerable rapidity; and by this the thread he produces is strongly twisted. As the thread becomes longer, he walks backward, spinning as he goes, till he comes to the end of the walk.

15. Much hemp is spun for thread, to weave into sailcloth. As a large ship takes thirteen or fourteen thousand yards of canvass, it is no little quantity that will suffice for our navy. Then all sorts of cordage, from the stout shrouds and cables down to the slenderest clew line, are made of hemp. Also netting of many different sorts and sizes, are manufactured from the same plant.

16. We may just observe, that hempen cloth bears a high price, being exceedingly strong and durable. Though a dozen hempen shirts may cost more at the first purchase, yet they will last twice as long as Irish linen.

17. The utility of hemp is not yet concluded; for after it is completely worn out as cloth, the remnants and rags become of great importance in the manufacture of paper. We have farther to add, that the seeds of hemp are not only given to birds in cages, but a very valuable oil is pressed from them, in a mill, (called rape oil,) of great use in many manufactures. When this is done, the refuse forms a glutinous

8 What of hemp? 9. The making of cordage? 10. The hemp-plant? 11—13. How is the tow

prepared? 14. How spun? 15. Is it wove into sailcloth? 16. What of hempen cloth? 17. The



cake; which, broken in pieces, fattens cattle very fast.

### LEATHER, &c.

18. All leather is made of skins. The raw skins are worn by savage nations, who do not know how to tan it; but it soon gets very stiff and hard, more likely to hurt the feet than to save them. Besides, raw skins when dry are but thin, and rather brittle than tough. It has been discovered, that soaking them in certain vegetable liquors seems to fill them up, and to give them thickness, firmness, and toughness. It also takes away their tendency to putrify and rot. This requires a long time, and is a very troublesome process, though very useful. It makes the skin quite a different thing from what it was.

19. The vegetable liquors, which hold what is called the tannin, are all very astringent; they seem to shrivel and bind up all they act upon. Oak bark yields this substance in the greatest plenty, as well as hemlock and a few other trees. You may see by the sides of a wood, where they have been cutting down many trees, long piles of this bark, which are of considerable value, as sold to the tanners.

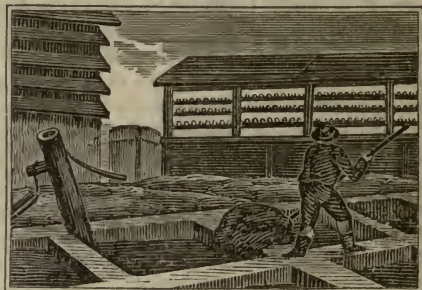
20. Skins are tough membranes, full, as it were, of jelly: if long boiled, they become jelly and are so made into glue. Galls, oak bark and such strong astringents, act upon this jelly called gelatine, and harden and fix it in the skin, which imbibes a gummy substance from the bark, and so forms the whole into leather.

21. The first part of the process of tanning is to steep the skins in water, to wash from them all the blood and dirt; then the horns, ears, and tail are cut off. They are next to be freed from the hair: this is done by laying them in water with lime for a few days. They are then taken out and drained; then put in again to fresh lime-pits, and so on, twice a week, for sev-

utility of hemp? 18. 19. What of leather?

eral weeks. The skins are then laid across a beam of wood, when the hair is scraped off with a proper knife.

22. The skins are then laid in other pits carefully, one over the other, with a layer of tan (which is the bark coarsely ground to powder) between each skin. Here they lie for months, only being changed into fresh pits, with stronger degrees of tan, till it is incorporated through the whole substance of the skin: it then becomes leather. It is of the hides of bullocks we have been speaking; and the leather so made is for the soles of shoes.



23. The skins, when sufficiently tanned, are dried, stretched, and cleaned. Cows' and calves' skins are tanned on the same principles; but do not lie so long in the tan.

24. This process takes many months: but some tanners accomplish the work in a few weeks, by suspending the skins in pits of tan, so that the liquor gets at them more easily than when they lie one upon another.

25. Softer leathers are not imbued with tan; but the thickening effect is produced by repeatedly soaking them in water, in which salt and alum have been dissolved.

26. The currier's business follows the tanner's, in all skins intended for upper leathers of shoes or the legs of boots. This consists in shaving or scraping the

20. Skins? 21—23. The process of tanning?

inside of the skin, with a peculiar kind of knife, to reduce its substance, and make it of an even thickness all over; it is then rubbed with train oil, or with oil and tal-low, to make it quite soft; or the flesh side is well waxed. Oil and lamp black give it a color; or copperas water blackens it, if not oiled.

27. Parchment is not manufactured at the tanner's; but, as it is made of skins, you may as well learn something of it here.

28. The skin, either of a sheep or a goat, will do for parchment. It must be soaked in the lime-pit, as before; it is then stretched on a frame, that it may be conveniently scraped with an iron, to get off the fleshy parts; it is then sprinkled with chalk dust, and rubbed with pumice stone. This scraping and chalking are done frequently to get it quite thin, and the chalk is well rubbed into its substance; it is then cut square, and the edges neat, and is fit to write upon. Parchment will last for a very long time; it is, therefore, useful for deeds, records, and any writing intended for those who come long after us. It was invented at Pergamos, and from thence it was called *pergamēta*, now parchment.

29. Vellum is the skin of very young calves, treated in the same manner; this is finer and neater, and fit, not only for writing, but for drawing on.

30. All the edges and cuttings of parchment are useful to make glue. The skins of any animals become a jelly with long boiling; which jelly, when cold, is quite hard. But the whole skins are too valuable; therefore, all the odd bits and cuttings which come off, and all about the head and feet, which are not worth making into leather, are boiled into glue.

31. Skins, when well tanned and quite

clean, are dyed of many beautiful colors. Kid gloves for the ladies must be all manner of delicate colors, straw, pink, light blue, &c. Gentlemen's gloves are either plain yellow, or various greenish shades. Then Morocco leather is a bright scarlet. The dying of skins is conducted on much the same principles as the dying of wool-len. The skin must first be prepared by a proper mordant, and then it will imbibe the coloring material from the liquid, as desired.

32. The uses of leather are well known. Besides being manufactured into shoes, boots, &c., it is used for a great variety of other purposes. There are few trades more useful than that of the shoe-maker, and perhaps not many that are more profitable, when it is carried on to a considerable extent. The town of Lynn in Massachusetts is celebrated for its manufacture of shoes. Great numbers are annually exported to the West Indies.

#### HIDES.

33. Hides signify, generally, the skins of beasts; but the term is more particularly applied to those of large cattle; such as bullocks, cows, horses &c. Hides are either raw or green; that is, the same as when taken off the carcass, or salted and seasoned, in which case they are dressed with salt, alum and saltpetre, to prevent them from putrefying; or they are cured or tanned. The hides of South America are in the highest repute, and vast quantities of them are annually imported into this country and sent to Europe.

#### CHAP. XXXI.

##### MISCELLANEOUS PRODUCTIONS.—CONTINUED

#### PAPER.

1. The manufacture of paper was not known by the ancients. The Egyptians

29. Vellum? 30. Glue? 31. The coloring of skins? 32. Shoes? 33. Hides?

25. What of softer leathers? 26. What is the currier's business? 27. 28. What of parchment?



wrote upon rolls of linen, and we have some of them about their mummies, at this very day, on which the inscriptions are very legible. A later invention of the Egyptians spread for many years over the literary world: this was forming the inner bark of the rush papyrus into a smooth sheet. From the term papyrus comes our modern name, paper.

2. Paper from this plant was in use till about the tenth century, when cotton was beaten into a pulp, and spread out for paper.

3. Who it was that first applied linen rags to the making of paper we do not know. In the thirteenth century it began to come into use; but we are to this day under great obligation to the inventor. The art of printing would have been of little avail, had not a material for printing on been discovered, sufficiently plentiful, cheap, and neat, for the purpose.

4. The material of which paper is now made, is only the rags and worn-out shreds of linen; what were of no use; what every tidy housewife used to burn out of the way, that they might not make a litter. These rags are now bought up by peddlers, who travel all over the country, and collect them in small quantities. They then come into the hands of the rag merchant, who is a considerable dealer, and he sells them to the paper-maker.

5. The first process is to sort these rags, according to their fineness or coarseness; this is done in a room where are a number of women seated, with each a parcel of divisions before her, five or six, into which she casts each separate piece, as she sorts them.

6. They are then to be cleansed, which is done by washing them well with hot water, by a mill.

7. The reducing them to shreds, and a pulp, used to be by pounding them; it is now done by cutting them. A large roller, full of knives, turns round in a trough which trough is also stuck full of similar blades, facing the other way; the rags are put in, with a proper quantity of water. As the roller, or cylinder, turns with great rapidity, it cuts every thing minutely fine, to a pulp, in a very little time. This is called half stuff.

8. Frequently, in this stage of the process, the rags are bleached, to take out all stains and color from them, and make them perfectly white; this bleaching consists in exposing them to the action of a sulphuric gas, which quickly discharges all color. The rags must be taken out as soon as the color vanishes, and well washed, else this same gas would destroy the rags themselves.

9. When the pulp is thoroughly comminuted and bleached, it is put into a cistern or vat, mingled with such a quantity of water as will suit for dipping out.

10. The next process is called couching. A mould, as it is termed, is a sort of sieve; consisting of a square frame, about an inch deep, with a bottom of brass wires very closely placed. This is dipped into the vat, and becomes filled with pulp. The water drains away through the interstices of the wires, and leaves a flat thin layer of pulp. The marks of the wires may be seen, if paper is held up to the light. This layer is carefully taken out, and placed on a square of felt, or coarse cloth. Another sheet, and another piece of felt are placed on, and on, till the heap contains six quires, or 144 sheets of paper, which is called a post. The weight of the heap presses the sheets a little; but when a post is made, the whole is smartly press-

1. Was the manufacture of paper known by the ancients? What of the Egyptian papyrus? 2. When was paper made from cotton? 3. From

linen? 4. What is the material of which paper is now made? 6. 7. When cleansed how are the rags reduced to shreds? 8. How bleached?

ed, felts and all, which squeezes out most of the superfluous water. Sheet by sheet is then separated from the felts and laid one on another. They are pressed again, and then hung up to dry.

11. The next operation is sizing, that is, saturating them with a weak sort of glue, mixed with alum, into which, as hot as the hand can bear, each sheet is dipped. This makes it hold ink; otherwise the ink would run, just as it does if you try to write on blotting paper.

12. The sheets are hung up to dry again. They are frequently pressed, and at last with great violence, to make them flat and smooth. The damaged sheets are then picked out, which make the two outside quires. Twenty-four sheets make a quire; and twenty quires, which make a ream, are tied up together, in wrappers, for sale.

13. This is the process for fine writing-paper. It is made of various sizes, and of various qualities, for printing, writing, or drawing. It is also made of various degrees of fineness: as, white, brown, blue, and common brown paper. The coarser sorts are made of coarser materials, even of old ropes, and sacking.

14. Papers are dyed of various colors, for the covers of magazines and pamphlets. Marbled paper is very beautiful: the manner of making it is as follows: a trough is provided, of the size of the paper to be marbled; this is filled with water strongly saturated with gum arabic. Different colors are then sprinkled on the surface of this gum water, according to the taste of the operator. These colors spread of themselves on the flat surface of the liquor; the sheet of paper is then adroitly laid on the flat surface, when it absorbs all the colors spread there. It is

taken off carefully, hung up to dry, and polished with a rubber.

#### BOOKS.

15. Books are divided into the following classes, according to the mode in which the sheets of the paper on which they are printed, are folded: namely, *folio*, when the sheet is folded into two leaves; *quarto*, when folded into four; *octavo* when folded into eight; *duodecimo*, when the sheet is folded into twelve &c. In making these classifications, no attention is paid to the size of the sheet.

16. *Copy-right* is the right which the authors or compilers of books, or treatises claim to the exclusive privilege of printing and publishing them. Musical compositions, engravings, maps, sculptures, models, &c. enjoy a similar protection.

17. The principal marts for books in the United States are New York, Boston and Philadelphia. The number of new publications that issue from the presses of these three cities is far greater than that which appears in all the rest of the country.

18. London is the great centre of the British book trade. It has been estimated that about 1,500 volumes of new publications are annually produced in Great Britain.

#### SPONGE.

19. Sponge is a soft, light, very porous and compressible substance, readily imbibing water and as readily giving it out again. It was formerly supposed to be a vegetable production, but it has lately been found to be an animal substance. The inhabitants in several of the Greek islands have been trained from their infancy to dive for sponges. They adhere firmly to the bottom; and are not detached without a good deal of trouble. The extraordinary clearness of the waters aids the divers.

10. What is the process of couching? 11. Sizing? 12. How many sheets make a quire? How many quires a ream? 14. What of the coloring of pa-

pers? 15. Into what classes are books divided? 16. What of copy-right? 17. Books in the U. States? 18. The British book-trade? 19. Sponge?



## CHAP. XXXII.

## MISCELLANEOUS.—CONTINUED.

## PINS.

1. The pins most in esteem are those of England. Pins are made of brass, drawn out into wire. Do you know how that is done? The bar of metal is drawn through a hole in an iron plate, which is rather too small for it; but the force employed by turning a wheel with great velocity, drags it through, especially as it is but a little smaller. It is then dragged through another hole, a little smaller than it now is; and so on, till the wire becomes small enough. What it thus loses in thickness, it gains in length, so that nothing is lost by the operation, and it is done with great rapidity.

2. It must then be rendered quite straight: to effect this, it is drawn again between iron pins, firmly fixed, so as to leave a straight path between the rows.

3 It is then cut into proper lengths, each sufficient to make six pins.

4. They must now be sharpened to their points. Boys sit, with each a couple of grindstones before him, one coarse and one fine, which are turned by a wheel. The boy takes up a handful of these lengths of wire, and claps all their ends flat against the coarse grindstone; taking care to keep them all turning round the while between his fingers. He then puts them to the finer stone, and afterwards serves the other ends the same; this is done quicker than one can tell you about it; for a lad can point thus, 16,000 pins in an hour's time.

5. The length of a pin is then taken off each end by another hand; when the remaining lengths are ground again to points, and shortened again, till the six pin lengths are taken off.

6. But the heading of pins is one of the most curious parts of the business: it is called head spinning. Suppose yourself in a pin manufactory and observe that girl: you see a straight wire; by a twirl of the wheel she twists another wire around it, to a considerable length, with the turns quite close together, so that you do not see the straight wire. When that straight wire is drawn out, the twisted part is hollow; so that you might see through it. This long string of wire is cut, two twists at a time, into bits; these are to make heads for the pins; but they must be softened, this is done by heating them red hot; they are then cooled. And now, you see, a heap of them in a dish is placed before each of these children. Now, mind what tools they have. Each has a little anvil before him, and a hammer which he works—that is, causes to strike upon the anvil—with his foot. Now watch him; see how cleverly he thrusts the blunt end of his pin into one of these hollow twists, which lie before him. And there, with a blow of his hammer, he has fastened it on; and has got another ready, quicker than you can discern. You are only afraid he should bruise his own fingers, by hitting so quick.

7. When a pin is made, it is still only yellow brass; and does not look nice and neat, fit for a lady's use. To give it whiteness, a solution of tin is prepared with wine lees. After a while the tin leaves the liquid, and fastens upon the brass. Still it looks very dull. To polish it therefore, they put numbers of them into a vessel of bran, which is turned round with great velocity. This rubs them, and they are found perfectly bright. The pins must now be regularly and neatly stuck in papers; so many in a row, and in this state they are ready for sale.

1.—5. Describe the manufacture of pins. 6. How is the heading of pins performed? 7. How

are pins polished? What is the last operation to be performed?

## GUNPOWDER.

8. Before gunpowder was invented, or at least brought into military use, the sword, and the spear, and the arrow, decided every battle: the arrow slew at a distance, but the sword and spear brought men hand to hand; in this case the fight was not ended till one or both of the combatants was killed. Such battles were always very bloody. It was not till the middle of the fourteenth century, that gunpowder was applied to war. It was loudly cried out against at first, as contrary to fair fighting. However, the use of it gained ground: it is now universal, and its use has changed the nature of all warfare, almost always confining it to a distance; by which war is rendered less destructive, not one bullet in 10,000 taking effect. It has changed too the nature of all fortification; for a high tower is now no defence, but an incumbrance. All fortifications at this time are flat, and almost level with the ground.

9. Gunpowder is a mixture of sulphur and charcoal, with nitre, or saltpetre. The sulphur easily takes fire with a spark; the charcoal holds the fire, and makes it very fierce; and the saltpetre, being decomposed by the fire, explodes. The gases generated hereby, having an amazing expansive force, will rend any thing to pieces in which they are enclosed. Now, a gun made very strong to bear this explosion, except towards the muzzle, where there is no opposition; finding vent that way, its explosion comes out at the mouth, and drives every thing before it. The ball, being placed there on purpose, is violently driven out; and passing through so long a tube, it takes the direction thus given to it, and strikes against what it hits with great violence; so that a bullet will enter a man's body, and make a grievous wound, and if it cuts any vital part, it kills him in-

stantly. The ball from a cannon, striking against a wall, will batter it down. A musket, it is said, will carry a mile. Ships, which have long guns, sometimes begin to fire at three miles' distance.

10. The three ingredients, sulphur, charcoal, and nitre, must be separately pounded into a very fine powder; they must then be mixed thoroughly together; in doing which they are kept wet, that they may not take fire, with water, or vinegar, or brandy, &c. When mixed, and the composition is a sort of paste, it is forced through a coarse sieve, by which it is brought into grains, which is the best state for explosion.

11. It happens every now and then, that the powder mills blow up; as all who are in them perish, we can never tell how it happened; we only know, that if by a nail in the mixture, or any how else, a spark of fire comes in among the powder, the explosion is instantaneous and irresistible.

12. Children who are very fond of playing with gunpowder, should not be suffered to do it, without some older person to take care. Many have had their eyes blown out, and been even killed, by accidents, of which they cannot be aware. To leave guns or pistols within their reach, is very wrong; children should never touch them: many a little boy has killed himself or his sister, by touching fire arms which were loaded, and went off by accident.

## ISINGLASS.

13. Isinglass is one of the purest and finest of the animal glues. It is a product, the preparation of which is almost peculiar to Russia. It is made of the air-bladders and sounds of different kinds of fish which are found in the large rivers which fall into the North Sea and the Caspian. The best isinglass is usually rolled in little ringlets; the second sort is laid together

8. What of gunpowder? 9. Its manufacture?

11. Accidents by gunpowder? 12. The danger



like the leaves of a book; and the common sort is dried without any care. When fine, it is of a white color, almost transparent and dry. It dissolves readily in boiling water, and is much used in cookery. It is also used in fining liquors of the fermented kind, and in making mock pearls, stiffening linens, silks, gauzes, &c. Boiled in milk it forms a mild, nutritious jelly, and is thus sometimes employed medicinally. This, when flavored by the art of the cook, is the *blanc mange* of our tables.

#### HOPS.

14. The hop is a perennial plant of which there are several varieties. When the hops are picked, they must be well dried in a kiln, on a hair cloth. They are laid nearly a foot thick, and will take ten or twelve hours to dry them. When they grow pretty warm, it is a good way to let down a tin cover over the whole mass, which reflects the heat back again on the tops, and helps to dry the upper part more equally. When they have been dried about three weeks, they should be put up in bags, and this is done as follows: a hole is cut in a floor, and a bag is fastened to its opening; a man then gets into the bag, and treads the hops down very close, while another man keeps putting in, by little and little, as many as it will hold. They are now ready for the market; yet if well prepared, they will keep some years, and be as good as ever.

15. When hops were first used in brewing, there was a great outcry against them; and in many places people were forbidden to use that poisonous weed, the hop. However, it has been found by experience, that the hop not only gives a pleasant bitter to ale, but, by breaking its viscosity, makes it more wholesome; and, also, by preventing its turning sour, enables it to keep longer.

of playing with it? 13. What of isinglass? 14. Hops? 15. Their first use? 16. What of

#### BRICKS.

16. Besides the wonderful productions of which the land is the fruitful source, the very substance of the soil itself is formed, by the ingenuity of man, into many important and useful articles. One of the coarsest, and perhaps the most early inventions of this nature, was to make it into bricks. At first, by reason of the little knowledge among mankind, and also possibly by the nature of the climate, bricks were only dried in the sun. In the Babylonian regions, where the invention began, and, indeed, all around, in those warm countries, they form their bricks in that manner to this day; yet the burning them is also very ancient.

17. We read, Gen. xi. 1—4, that when, after the flood, the tribes of men journeyed eastward, they found the plains of Shinar fertile and convenient; and they said, "Go to now, let us build a city, and a tower whose top may reach to heaven. They had brick for stone, which they burnt thoroughly, and slime (that is bitumen) had they for mortar." This was the famous Tower of Babel. And although the tribes and families of Noah's sons were scattered by God for their profane attempt, yet the spot was still preferred by some, and it became afterwards the grand city, Babylon. This city has indeed long been destroyed, according to prophecy; yet among the heaps of ruins, which are all that now remain of it, are found bricks of considerable size, and in a state of hardness and preservation.

18. The children of Israel, too, were in Egypt kept at hard labour in this same occupation; and by the tyranny of Pharaoh were obliged to make bricks without straw.

19. In many countries, stone is scarce and dear, so that bricks are made use of,

bricks? 17—19. Are they mentioned in the bible? 20 Of what are they composed? 21. How are

not only for common habitations, but for some grand and costly buildings.

20. Bricks are composed of earth made into squarish lumps, and, by burning, half vitrified and made hard.—The best earth for this purpose is a clay rather red in its color, and soft to the touch; a little sandy, but not too much so. Almost any earth that is free from stones will do very well; though some sorts are far preferable to others.

21. Although bricks may be manufactured from almost any kind of earth, yet there is much preparation necessary to make them good and durable. One of the first and most important operations is to knead, or mix up, and work the clay into a uniform and pliable mass: such as will have no lumps, but is quite smooth. This kneading, too, makes the clay tough and gluey. This is done in small quantities, by riding a horse round and round in it, who treads it with his feet. But sometimes, a mill is erected, which is turned by a horse, and grinds and mixes the materials thoroughly.

22. The clay should be dug, or cast, before the winter sets in; and, after enduring the frosts, it will in the spring be fit for tempering and making up: indeed, if dug two years before used, it is better still.

23. Bricks are shaped in a wooden mould, an inch larger than the brick is wanted to be, as it shrinks in burning. The man takes a lump of clay, and forcibly thrusts it into the mould, so as to make it fill the corners. He presses it in with his knuckles, and then, by the straight edge of a board, he strikes it over the top, and scrapes off all the clay which was more than enough to fill the mould. This done, he shakes it out, and forms another. One is made in less time than

we have taken to tell how it is done; for a good workman, who works early and late, will mould five thousand in one day's work.

24. Boys then, on latticed barrows, wheel a parcel of them away, to that part of the field where they are to dry. They are placed so as not to touch each other, in long ranges, called hacks, which are loosely covered with straw, that neither the sun may dry them too fast, nor the rain prevent them from drying. After a few days drying they are placed afresh and turned, so that all sides may get the wind equally.

25. When the bricks are pretty well dried, they are ready for burning. The burning is done in the country chiefly in kilns which are composed of four walls, open at top. In the hollow within the bricks are placed, each at a distance from its neighbors, so that when a fire is kindled at bottom it rises through all these interstices, and bakes the whole in about two days and nights; often 20,000 at once.

26. Tiles are thin bricks, made in much the same way, only the earth should be better. Some are flat, and some twisted, called pantiles. As bricks are used for building the walls of houses, tiles are used for covering their roofs.

#### STARCH.

27. Starch is a substance obtained from vegetables. It is generally of a fine white color, has scarcely any smell, and very little taste. When kept dry, it continues for a long time uninjured, though exposed to the air. It is insoluble in cold water; but combines with boiling water—forming with it a kind of jelly. Potatoo starch goes a good deal further than wheat starch—a less quantity of it sufficing to form a paste of equal thickness, with water.

they prepared? 22. How should the clay be? 23. How are they shaped? 24. What precautions

are used in drying them? 25. How are they burned? What are tiles? 27. What of starch?



## PEARL ASHES.

28. Pearl ashes are prepared by mixing the ashes of burnt wood with water, evaporating the clear ley, and calcining them for a considerable time in an oven moderately hot. The goodness of pearl-ashes is distinguished by their strong body, and an uniform white appearance: and their value decreases in proportion as they assume a blue cast. Pearl-ashes are chiefly prepared in North America, Hungary, Poland and Russia. They are much used in the manufacture of glass, as also for bleaching.

## HORSES.

29. The horse is known to most nations as the most useful and manageable of those animals which live under the sway of man. Besides his invaluable services whilst alive, after death his skin is used for a variety of purposes. The hair of his mane and tail is employed for chair-bottoms, mattresses, &c. His flesh although rejected among civilized nations, is much used among several rude tribes. The life of the horse, when not shortened by ill-usage, extends from twenty-five to thirty years. The Arabian horses are the most esteemed for beauty and speed.

30. Wild horses are found in various parts of Texas and South America. They are supposed to be descendants of those which were originally introduced by the Spaniards. The herds of wild horses present a beautiful spectacle when they are alarmed in their native wilds by the intrusion of an army. Instead of flying, as the deer and other timid animals, they gallop round in compact masses of many thousands, apparently for the purpose of reconnoitring the strangers; and frequently advance boldly to within a few yards of the line of march, where they halt to gaze at the troops, snorting and

showing every sign of astonishment and displeasure, especially at sight of the cavalry. These droves are always headed by some fine looking old bashaws, whose flowing manes and tails plainly show that they have never been subject to man's control; and in the rear the mares and colts follow.

## THE ASS.

31. We may as well here speak of that much despised and much abused animal—the ass. Could we see him in his native state, in the warm climates of Africa we should find him all life and spirit; but in a cold country, he is rather dull and heavy. As his lot is to be the property of the poor, he partakes with them in their wants, and suffers under their ignorance and brutality. It is true, he will feed upon plants which horses refuse, esteeming a thistle, with its prickles, much as we do a sallad, when heightened with mustard and vinegar. But he does not always get his fill, even of such homely fare; and in winter, when the hedges fail him, he is but poorly provided with hay; as to corn, he never thinks of it. Though easily fed, yet the ass is peculiarly dainty in drinking; none but the clearest waters will he touch. He is as careful too, not to wet feet, but will go round a puddle rather than through it, even when loaded. It has been said, that were a higher class to take him in hand, and rear him with gentleness and care, the ass would be more docile and more serviceable.

## CHAP. XXXIII.

## MODES OF CONVEYANCE.

1. The most ancient mode of conducting the traffic of distant nations, was by caravans. Of this nation was the company of Midianites or Ishmaelites, to whom Joseph

28. Pearl-ashes? 29. What of horses? 30. Wild horses? 31. The ass?

1. What was the most ancient mode of conducting the traffic of distant nations? 2. What

was sold, (*Genesis* xxxvii. 28.) Such caravans are in use at the present day, and consist sometimes of forty thousand persons, sometimes almost double that number, besides six or seven thousand camels, and some hundred horses. Those, which are called *heavy caravans*, have in them elephants also.

2. Any one who wishes to travel, may collect a caravan; but they are seldom gathered by private persons. Most commonly they are public concerns, gathered and regulated by authority; they set off on a fixed day, and are under a sort of military discipline. Four caravans go every year to Mecca, with the Mohammedan pilgrims, to the tomb of the Prophet. One from the European provinces, which sets out from Damascus; one from the Barbary States and Egypt; a third from Arabia; and a fourth from the parts about Babylon, with which come the Persian devotees.

3. There are four officers to such a company. One has supreme command; a second is the guide, who regulates the march; a third rules when the caravan stops to rest; and the fourth regulates the distribution of the provisions. Almost all the commerce of those countries is conducted thus. Merchants take the opportunity of so large a body, many of whom are regular troops, to travel in safety, through the Deserts especially, where the wandering Arabs think they have a right to plunder all whom they can overcome. In the history of commerce appended, is an account of a caravan taken by Richard I., of England, with all its varied and rich commodities.

4. The *camels*, which journey to Mecca, have rich furniture; those which carry the presents made by the princes to the tomb of Mohammed, are magnificently accoutred.

of caravans? 3. How are they conducted? 4. How are the camels accoutred on such journeys?

Their various stages in the journey are regulated, as they must arrive at Mecca by a certain day. They continue only twelve days there; during which short period, a very large and profitable trade is carried on, in the exchange of the most precious productions of India, Persia, Egypt, Barbary, and Europe.

5. As they have not roads like ours, in those Eastern countries, nor any inns to accommodate travellers, they must take with them all they want. Yet in many places are buildings erected, for their use, called *caravanserais*. These, however, only afford shelter; for neither food, nor beds, nor servants, can be had.

6. The *Caffila* is somewhat similar to the caravan. In the East Indies, it always belongs to some prince; whereas, a caravan is an association of various persons. But in Africa, the term intimates generally, a company of dealers, who thus convey their slaves for sale, with gold-dust, salt, and other valuable commodities; travelling together for greater security and mutual assistance. They go from the centre of Negroland, sometimes eastward towards Egypt, and sometimes westward towards Senegal. In those countries, it is frequently called a *coffle*.

7. Something akin to this *coffle*, once was common in England; when whole trains of *pack-horses* used to travel, loaded with woollen goods, over the hills and moors of Yorkshire; led by the foremost horse, old, steady, and well accustomed to the road; and regulated by only one man, who brought up the rear.

8. Even now too, in Spain, strings of *mules* are employed in the same way; and the *arricaos* or muleteers form a numerous and rather conspicuous part of the Spanish population. Mules are preferred in Spain for driving, as being more sure-

5. What are caravanserais? 6. What of the *caffila*? 7. The *coffle*? 8. What of mules in Spain?



footed and hardier of living than horses. Besides which, there are caravans of mules, with loads on their backs, constantly crossing Spain on the various roads, carrying corn, rice, flour, pulse, wine, and oil in skins, as well as goods from the seaports to the interior. The muleteer is a jovial being; he wanders all over the country; his home is every where: light-hearted and happy, he is also honest, and his punctuality may in general be depended upon. He is very kind to his mules, calls them by their names, talks to them, scolds them, and his first care on arriving at the inn is to see them comfortably provided for, and then, and not till then, he thinks of himself.

9. Mules are much used for travelling in South America. Travellers in the United States can have but a faint idea of the labor and danger of crossing the Andes, that immense mountain chain by



which the continent of South America is intersected, from its southern to its most northern extremity, dividing Peru and Chile, on the western coasts from Colombia and Brazil on the eastern. Many of the passes are upwards of 18,000 feet, or nearly four miles, above the level of the sea. In some parts, men, who have made it their sole occupation, carry the passenger up the most steep and dangerous paths, in a kind of chair fastened to their

backs; but in general, the journey is made by travellers mounted on the patient and sure-footed mule. The following description of a journey with mules is from the account of a recent traveller in South America.

10 "As I was looking up at the region of snow, and as my mule was scrambling along the steep of rock, the captain overtook me, and asked me if I chose to come on, as he was going to look at a very dangerous part of the road, which we were approaching, to see if it were passable, before the mules came to it. In half an hour we arrived at the spot. It is the worst pass in the whole road over the Andes. The mountain above appears almost perpendicular, and in one continued slope down to a rapid torrent that is raging underneath. The surface is covered with loose earth and stones, which have been brought down by the waters. The path goes across this slope, and is very bad for about seventy yards, being only a few inches broad; but the point of danger is a spot, where the water, which comes down from the top of the mountain, either washes the path away, or covers it over with loose stones. In some places, the rock almost touches one's shoulder, while the precipice is immediately under the opposite foot, and high overhead are a number of loose stones, which appear as if the slightest touch would send them rolling into the torrent beneath, which is foaming and running with great violence.

11. "As soon as we had crossed the pass, which is only seventy yards long, the captain told me it was a very bad place for baggage-mules; that four hundred had been lost there; and that we should probably lose one.

12. "The drove of mules now came in sight, one following another: a few were carrying no burdens, but the rest were

either mounted or heavily laden. As soon as the leading mule came to the commencement of the pass, he stopped, evidently unwilling to proceed, and of course all the rest stopped also.

13. "He was the finest mule we had, and, on that account, had twice as much to carry as any of the others. With his nose to the ground, literally smelling his way, he walked gently on, often changing the position of his feet, if he found the ground would not bear, until he came to the bad part of the pass, when he stopped; but the drivers threw stones at him, and he continued his path in safety, and several others followed.

14. "At length, a young mule, carrying a portmanteau, with two large sacks of provisions, and many other things, in passing the bad point, struck his load against the rock, which knocked his two hind legs over the precipice, and the loose stones immediately began to roll away from under them: however, his fore legs were still upon the narrow path: he had no room to put his head there, but he placed his nose on the path to his left, and appeared to hold on by his mouth: his perilous fate was soon decided by a loose mule, who, in walking along after him, knocked his comrade's nose off the path, destroyed his balance, and head over heels the poor creature instantly commenced a fall, which was really quite terrific.

15. "With all his baggage firmly lashed to him, he rolled down the steep slope, until he came to the part which was perpendicular, and then he seemed to bound off, and turning round in the air, fell into the deep torrent, on his back, and upon his baggage, and instantly disappeared.

16. "To any other animal but a mule this fall must have been fatal; he was carried down by the stream in spite of all his

efforts, and, turning the corner of a rock, was given up for lost. At length I saw at a distance a solitary mule walking towards us! We instantly perceived that he was the Phaëton whose fall we had just witnessed, and in a few moments he came up to us to join his comrades. He was, of course dripping wet, his eye looked dull, and his whole countenance was dejected, but none of his bones were broken: he was very little cut, and his sound appearance was actually incredible."

17. The large, heavy wagons, which cross the Alleghany mountains, in the United States, are well worthy of mention. The exchange of goods between the eastern and western parts of Pennsylvania is mostly effected by means of these wagons. They are drawn by five or six horses, and are built very stout for travelling the rough roads across the mountains. They have coverings of cloth, supported by strong wooden hoops, and carry very heavy loads. The horses have small bells attached to the harness, as they are called, and the merry jingle of these, when passing through the woods, is very pleasant. These bells serve as music to the tired teamster, but they also answer a more important purpose; being heard at a distance, they give information in season, that no accident may happen by two teams coming in contact, by meeting unexpectedly in the night. Sixty or more of these large wagons may often be seen in a line.

18. There is a traffic carried on between St. Louis in Missouri and Santa Fe in Mexico, by caravans of mules and horse wagons. They carry to Santa Fe manufactured goods, tobacco, spirits, &c. and receive specie, or gold and silver ore in return. Herds of wild buffaloes are sometimes met on this route. These roam in thousands over the far western prairies, and swim large rivers in nearly the

des? 17. What of the large wagons of the Alle-

ghanies? 18 What of the trade between St



same order, in which they traverse the plains.



19. In winter when the ground is covered with snow, travelling in sleighs is a rapid and favorite mode of conveyance. Bells are usually attached to some part of the harness, in order to give warning to



the foot-passenger. The sledge of the Laplander may be mentioned in this place. It is shaped somewhat like a small boat, and is usually drawn by the reindeer, who glides with incredible swiftness over the snow and ice. This animal, it is said, can run with ease two hundred miles a day.

20. The invention of rail-roads promises to increase the facility of communication between distant places to a wonderful degree. Iron grooves are sunk in wooden

frames, on the ground; and the wagons are furnished with iron wheels, which run in these grooves with very little friction.

21. Gravity, horse-power and steam-power have been used on rail-roads. Where the road is sufficiently sloping in one direction, the force of gravity may move the carriage in that direction. Locomotive or steam engines are much used in England, and there are several in this country. It has been computed that one of these locomotive engines will perform the work of 240 horses travelling at the rate of ten miles per hour upon a turnpike road, the velocity of the locomotive being fifteen miles per hour.

22. The Quincy rail-road was the first work of the kind attempted in the United States. It was constructed solely for the transportation of granite, and commences at the granite quarry in Quincy, and terminates at the Neponset River, which flows into Boston harbor. It is three miles in length. Many other rail-roads are in the course of construction through different parts of Massachusetts. The principal of these are the Boston and Lowell rail-road, and the Boston and Worcester rail-road.

23. The Mohawk and Hudson rail-road in New York was begun in 1830, and is to extend from the Hudson at Albany, to the Erie canal at Schenectady. Steam cars have travelled upon it with a load of eight tons, at the rate of thirty miles per hour. The Camden and Amboy rail-road commences at Camden on the Delaware, opposite to Philadelphia, and terminates at Amboy. The whole distance in a direct line is sixty miles.

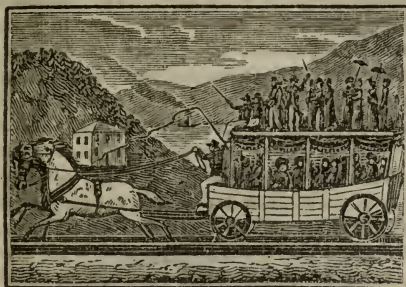
24. The Baltimore and Ohio rail-road is intended to unite the city of Baltimore with the great Ohio River. A considera-

Louis and Santa Fe? 19. Travelling in sleighs &c. 20. The invention of rail-roads? 21. The powers used upon rail-roads? 22. What of the

Quincy rail-road? Other rail-roads in Massachusetts? 23. The Mohawk and Hudson rail-road? Camden and Amboy? 24. The Baltimore and

ble part of it is already completed, and cars are now in operation upon it. Passengers

an awakened attention seems to have been turned to the subject.



are conveyed in these cars with great rapidity to different points on the road. The length of this rail-road when completed will be one hundred and eighty miles, and there will be but one summit in the whole line requiring stationary power. The estimated expense is twenty thousand dollars per mile. The bridges are all built of stone. One, over Gwynn's Falls, consists of a single arch of eighty feet span, with an elevation of fifty-eight feet to the top of the parapet, and three hundred feet in length. Another, across the Petapsco has two arches of fifty-five feet span each, and two of twenty feet span. It rises forty-six feet high, and is three hundred and seventy-five feet long. The deepest cut will be seventy-nine feet, and the highest embankment fifty-seven feet. In one place the road has been carried through a solid mass of rock rising fifty-eight feet above its surface.

25. We have mentioned but a few of the principal rail-roads in the United States. These means of conveyance, are fast multiplying throughout our vast country and can hardly fail to produce the most beneficial results. In England rail-roads have increased amazingly within the last twelve years; and throughout Europe

Ohio? 25. The increase of this means of transportation?

## CHAP. XXXIV.

### MODES OF CONVEYANCE.—CONTINUED.

1. The most wonderful, and at the same time most convenient method of transporting goods from one country to another, is by means of a ship. That a body so large and so heavily laden, should float on the water; that it should be so well-balanced as not to tilt over; that mariners should be able to guide its movements to any quarter of the globe, and in any manner they please, are all circumstances of great importance, and exhibit in a striking light the power and ingenuity of man.

2. A single ship is a beautiful object; when in full sail she glides majestically along, cutting the waves with her sharp prow, and dashing them behind in her foaming wake. The eye is never weary in watching her steady and graceful motions.



3. A fleet of ships coming into port, to the amount of one hundred and fifty sail perhaps of merchantmen, is certainly a grand sight; all under regulated movements, and bearing treasures to the amount of some millions of money. The communication is mutually beneficial; the inter-

1. 2. What is said of the ship? 3. A fleet of ships? 4. The English East India ships? 5. The



change of commodities is advantageous; the comforts of both regions are more than doubled by the traffic.

4. The English East India ships are often of one thousand two hundred tons burden. Their value, when richly laden, is immense. Galleons, are very large ships, employed by the Spaniards, to convey the treasures of the East Indies across the great Pacific, to Acapulco; or, in the Atlantic, to bring the produce of the American mines of gold and silver, to Europe, to the mother country. Those which come to Europe, are collectively called the *Flota*.

5. Ships from their size are, in many cases, unable to approach near the shore. There is a need of smaller vessels, to convey their merchandise or their passengers to and from the land: such as *boats*, which are moved with oars; or *hoys*, *smacks*, *cutters*, &c. which have masts and sails.

6. The Chinese vessels are called *junks*;



they are but small, compared with ours; but they may be seen in great numbers on their canals.

7. By *canoe* is meant a sort of boat, not built up with ribs and planks, but hollowed out of one single trunk of a tree, and shaped for the purpose: so they are often constructed in the tropical part of the Atlantic and by the North American Indians.

names of some smaller vessels? 6. The Chinese

In the more northern and southern parts, they are formed with pieces of bark sewed together. The Greenlanders' canoe is made with very slender laths joined with whalebone, and covered with seal skins.

8. The *proas*, used among the Ladrone Isles, have always excited surprise; as they will sail at the rate of twenty miles an hour, owing to their peculiar construction. One side of these canoes, that which is on the lee side, or away from the wind, is entirely straight, the other is bowed out, in the usual shape. The ends are by this means made very sharp, to cut the water, especially as they are made narrower hereby. Both ends are equally sharp; so that the navigators have no need to turn, but can come back again with ease. Canoes thus formed would be very liable to turn over; indeed, they could hardly live in a rough sea. To prevent this, the Ladronees have an out-rigger, consisting of a frame projecting on the windward side, with a log of wood, shaped like a boat, at its end. The weight of this frame keeps the balance, for the wind can hardly tilt the canoe so as to raise the frame out of the water; while the hollowness of the little boat prevents its sinking on that side. The planks of this proa are sewed together with strips of bark: no iron being used in it. The sails consist of mats; and the masts, yards, and out-rigger, are made of the bamboo, which is extremely light.

9. Inland commerce is carried on by water in a great measure, in many countries. Our own country is now well supplied with *canals*; Holland has long been famous for such conveniences; and China is intersected to a very great degree by them. It is said, that as many inhabitants of that country live and die on the water, as on land.

10. *Canal boats* are generally of peculiar junks? 7. The canoe? 8. The proas? 9. Canals?

dimensions, suited to their particular purpose, and to nothing else. They are some-



times seventy feet long, and only six feet wide; that they may be able to pass each other without requiring the canal to be of an inconvenient width. They will contain a very large quantity of goods, and yet may be drawn by a single horse with tolerable ease. There is a towing-path on the side of the canal, for the horses.

11. One of the most remarkable discoveries of modern times is the art of propelling vessels by steam. The principle is, by a steam engine of considerable power, to work a large wheel, or rather two wheels, one on each side, which, by paddles, push against the water, and thus shove the vessel forward. For the first successful application of this discovery, the world is indebted to Robert Fulton, an American. His account of the construction of his first steamboat is well worthy the perusal of my young readers: it is taken from Judge Story's Discourse before the Boston Mechanics' Institution.

12. "When," said Fulton, "I was building my first steamboat at New York, the project was viewed by the public either with indifference, or with contempt as a visionary scheme. My friends indeed were civil, but they were shy. They listened with patience to my explanations, but with a settled cast of incredulity on their

countenances. I felt the full force of the lamentation of the poet,

"Truths would you teach to save a sinking land,  
All shun, none aid you, and few understand."

As I had occasion to pass daily to and from the building yard, while my boat was in progress, I have often loitered unknown near the idle groups of strangers, gathering in little circles, and heard various inquiries as to the object of this new vehicle. The language was uniformly that of scorn, or sneer, or ridicule. The loud laugh often rose at my expense; the dry jest; the wise calculation of losses and expenditures; the dull but endless repetition of the Fulton Folly.

13. "Never did a single encouraging remark, a bright hope, or a warm wish, cross my path. Silence itself was but politeness, veiling its doubts, or hiding its reproaches. At length the day arrived when the experiment was to be put in operation. To me it was a most trying and interesting occasion. I invited many friends to go on board to witness the first successful trip. Many of them did me the favor to attend, as a matter of personal respect; but it was manifest that they did it with reluctance, fearing to be the partners of my mortification, and not of my triumph. I was well aware, that in my case there were many reasons to doubt of my own success. The machinery was new and ill made; many parts of it were constructed by mechanics unaccustomed to such work; and unexpected difficulties might reasonably be presumed to present themselves from other causes.

14. "The moment arrived, in which the word was to be given for the vessel to move. My friends were in groups on the deck. There was anxiety mixed with fear among them. They were silent, and sad, and weary. I read in their looks nothing but disaster, and almost repented of my



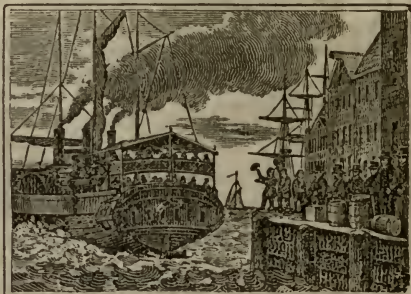
efforts The signal was given, and the boat moved on a short distance, and then stopped and became immovable. To the silence of the preceding moment now succeeded murmurs of discontent and agitations, and whispers and shrugs. I could hear distinctly repeated, 'I told you it would be so—it is a foolish scheme—I wish we were well out of it.' I elevated myself upon a platform, and addressed the assembly. I stated, that I knew not what was the matter; but if they would be quiet, and indulge me for a half hour, I would either go on, or abandon the voyage for that time.

15. "This short respite was conceded without objection. I went below, examined the machinery, and discovered that the cause was a slight mal-adjustment of some of the work. In a short period it was obviated. The boat was again put in motion. She continued to move on. All were still incredulous. None seemed willing to trust the evidence of their own senses. We left the fair city of New York; we passed through the romantic and ever-varying scenery of the highlands; we descried the clustering houses of Albany; we reached its shores; and then, even then, when all seemed achieved, I was the victim of disappointment. Imagination superseded the influence of fact. It was then doubted, if it could be done again; or if done, it was doubted if it could be made of any great value."

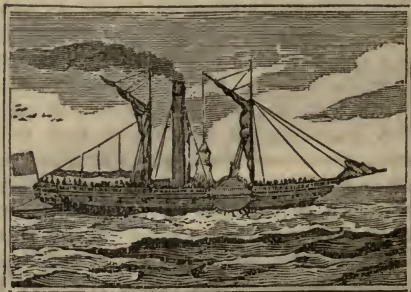
16. Since the death of Fulton, steamboats have multiplied to an incredible extent in all parts of the world; but nowhere to such an extent as on the broad Mississippi and other mighty rivers of the west. Some of the steamboats of the Mississippi are fitted up in an uncommon style of elegance, and may almost merit the designation of "floating palaces." Steam-

is Fulton's account of the trial of his first steamboat? 15. What of the increase of steamboats?

boats pass between Providence and New York, through Long Island Sound, during all the open season. Nearly the whole of the summer travelling from Boston to the south passes by this route.



17. On the canals, and river navigation of England, steamboats are very frequent; yet, at present, they are rather used for conveying passengers than goods. They venture out to sea, cross the Atlantic, and even go to the East Indies. They use



masts and sails when the wind suits; but as they can go by steam only, without sails, if the wind be against them, which totally prevents a ship from proceeding, it is no great impediment to the steam vessel: it makes its way in spite of contrary winds and adverse tides.

18. We have one sort of water conveyance not yet noted, although it is very an-

Steamboats on the Mississippi? 17. In England? 18. What of the timber-boat? 19. Timber cut in

cient, and in some places, even now, of great use; that is, the *timber float*. The timber from Lebanon, intended for Solomon's temple, was floated in the sea to Joppa, from whence it was taken by land carriage to Jerusalem.

19. Much of the timber cut in Norway is floated down the rivers, to the cities, from whence it is to be exported to other countries. A considerable proportion of this is split, shivered to pieces, or otherwise damaged, in its adventurous voyage. Yet upon the whole, this is the cheapest mode of transit; and in some cases, owing to the ruggedness of the country, the only method by which such bulky materials could be conveyed to the place of sale.

20. But the grand floatage of the present day in Europe takes place on the Rhine. On its broad stream, floats of timber trees, to the value of thirty thousand pounds, in one mass, proceed every year, from the forests near its source, to the cities of the Netherlands, where they are broken up for sale. The mass is often a thousand feet long, and nearly a hundred in width, and of a thickness sufficient to raise the upper part seven feet out of the water. These trees are all firmly pinned and bound together. It requires



several hundred men to navigate such an unwieldy concern; and these live on the float, in two rows of huts formed on

Norway? 20. The timber-floats of the Rhine? 21. What is a raft? 22. What of timber in Maine?

it, with a regular street between them. Several smaller floats go in front, by means of which the great body is towed along, clear from obstructions.

21. A *raft* is a small flooring of timber, such as comes to hand, in case of shipwreck; which, being fastened together will float passengers and goods, though with much inconvenience, yet safely, to the shore. A raft, too, is the form in which timbers are, in the Baltic, conveyed to the shipping, which wait to transport them to foreign countries.

22. The northern parts of Maine furnish vast quantities of timber. The trees are felled in the depth of winter by parties which go into the woods in autumn for that purpose, and cut down the trees after the ground is covered with snow sufficiently to enable them to drag the timber by oxen to the rivers where they are rolled upon the ice. When the ice melts in the spring, the logs are floated down to the sea. Where the rivers are wide and un-



interrupted by falls, the logs are fastened together in rafts.

23. Immense timber rafts may often be seen upon Lake Champlain, floating down on their way to Albany and the towns on the Hudson. These rafts contain houses for lodging the crews; and when the wind is fair, sails are fixed up to assist their course.

When are the trees felled? 23. Timber-rafts on Lake Champlain?



## CHAP. XXXV.

## FACILITIES FOR PROSECUTING COMMERCE.

1. Of all the discoveries made by man, that of communicating thoughts, and especially of rendering them permanent, by means of letters, is certainly the most wonderful and important. By this means have all the great inventions and sublime productions of human genius been communicated from one nation to another, and with successive improvements transmitted from generation to generation. The scientific and literary acquirements of the ancients have thus become the property of the moderns. They still live in their literary labors; their thoughts exist in their writings, and after the lapse of above two thousand years, we enjoy their conversation, and are enlightened by their instructions. The knowledge of the preceding is, thus, the foundation of that of the present century, which, still improved and extended, will illuminate posterity.

2. The opinions of authors concerning the origin of letters are various. The Indians, the Chinese, the Chaldeans, the Arabians, the Egyptians, the Phenicians, have respectively their pretensions to that honor. Memnon, the Egyptian, is by some supposed to have invented letters in the year 1822 before Christ. Letters were first brought into Greece by Cadmus, the Phenician, who was contemporary with David. His alphabet consisted of sixteen letters, and the rest were added afterwards, as signs for proper sounds were needed.

3. To write, or, in other words, to express the thoughts to the eye, was early attempted in Egypt, by means of hieroglyphics: these were figures of animals, parts of the human body, and even mechanical instruments; as the former were made choice of on account of the pecu-

liar properties or qualities of the animals, so they are said to have represented similar qualities in the gods, heroes, or others to whom they were applied.

4. But these were not confined to Egypt: figures, composed of feathers, were employed to express ideas, in Peru; and Montezuma received intelligence of the invasion of his kingdom by the Spaniards, in this way. In Peru, arithmetic was composed only of different colored knots.

5. The next step in the progress of writing, appears to be the expression of a word by a single mark or letter, which is the Chinese method of writing. They have upwards of sixty thousand of these marks, which they employ in affairs of science. Instead of using marks to represent words, which are infinite, we employ letters to represent articulate sounds, which compose words. Their inferior and inconvenient mode of writing readily accounts for the state of literature among the Chinese, and their relative superiority in respect to the arts, being imitative, may be acquired by practice or oral instruction.

6. The art of writing seems to have been known in Greece when Homer composed the Iliad, and Odyssey; and ciphers, invented in Hindoostan, were brought into France from Arabia about the end of the tenth century.

7. The ancient order of writing was from right to left, and this method prevailed even among the Greeks. They used, afterwards, to write alternately from right to left, and from left to right; this continued to the time of Solon, the famous Athenian legislator. The motion from the left to the right being found more natural and convenient, this method was adopted by all the European nations.

8. Writing was first exhibited on pillars and tables of stone; afterwards on lead,

1. What of the invention of letters? 2. To whom is the discovery attributed? 3. What of

hieroglyphics? Writing in Peru and Mexico? 5. Chinese writing? 6. The Iliad? 7. What was

and on plates of the softer metals. When it became more extensively practised, in some countries, the leaves of plants and the bark of trees were used; in others, tablets of wood covered with a thin coat of soft wax, on which the impression was made with a stylus, or pen of iron. After this, parchment made of the hides of animals was used.

#### THE MAIL SYSTEM, &c.

9. The establishment of posts, by which letters and packets may be regularly conveyed from one place to another, has proved one of the most effective instruments of civilisation. "We find the first posts in the Persian empire. Darius I, son of Hystaspes, caused couriers, with saddled horses, to stand ready at different stations throughout the empire, situated one day's journey from each other, in order to receive reports from the provinces without delay.

10. "The name of *posts* is said to be derived from the Latin *positus*, which means *placed*, because horses were *put* at certain distances, to transport letters or travellers. In the ninth century, there existed in Germany, France and Italy, messengers who travelled on horseback, destined, however only for the service of government; and this establishment, besides, was of little duration.

11. "Carrier pigeons are used in the east, and became known in Europe through the Crusaders, but seem never to have been introduced in the latter part of the world to any extent. The pigeons chosen for this service are called, in Arabic, *hamahn*. They build their nests in the neighborhood of human habitations. The first pigeon used as a messenger, some consider to be that which Noah sent from the ark, and which returned with

the leaf of the olive. An actual post system, in which pigeons were the messengers, was established by the sultan Nouredin Mahmood, who died in 1174. It was improved and extended by the caliph of Bagdad, who died in 1225. The price of a well-trained pair of such pigeons was, at that time, one thousand Arabian ducats. This flying post lasted till 1258, when Bagdad fell into the hands of the Mongols, and was destroyed by them. At present, only a few wealthy individuals in the east keep these pigeons. It requires much time and patience to train them.

12. "As soon as the young are fledged, they are made as tame as possible, and accustomed to each other's society. They are then sent in an uncovered cage to the place whither they are usually to carry messages. If one of them is carried away, after having been well treated for some time, it will certainly return to its mate. A small letter is written on the finest silk-paper, sometimes on a particular kind called bird-paper. This is placed lengthwise under one wing, and fastened with a pin to a feather. A pigeon of this kind can go a distance of more than 2700 miles in a day. It is well known, that some merchants in Paris and Amsterdam employ carrier pigeons, in order that the prices of stocks &c. in Paris, may be known as soon as possible in Amsterdam.

13. "When commerce began to flourish, the larger commercial cities, particularly of Germany, began to establish mounted messengers and stage-coaches. Travelling merchants and butchers, who rode about the country to buy cattle, used to take charge of letters.

14. "In the year 1654, a regular post office was established in England, by

the ancient order of writing? 8. How was writing first exhibited? 9. What is said of the establishment of posts? 10. Whence is the name de-

rived? 11. 12. What of carrier-pigeons? 13. How were letters conveyed of old in Germany? 14. When was a regular post-office established in



Cromwell, and since that time the system has been improved by various acts of parliament. About the year 1784, a great improvement was made in the mode of conveying the mails. Instead of sending the mails by a boy on horseback, or in carts, it was proposed that government should contract with the masters of coaches to carry the mail, along with a guard, for its protection. The plan was finally established, and met with complete success. The regularity with which the post now comes and goes, and the letters are received and distributed in England, is remarkable. Nowhere is the inviolability of letters more respected than in England and the United States.

15. "In the English colonies in North America, a post-office was projected as early as 1692. The first office in the colonies was established in 1710, by an act of parliament, 'for establishing a general post-office for all her majesty's dominions.' The postmaster general was to be 'at liberty to keep one chief letter-office in New York, and other chief offices at some convenient place or places in each of her majesty's provinces or colonies in America.'

16. "After the breaking out of the revolution, this department came of course under the control of the congress of the confederacy. The constitution of the United States, adopted in 1789, gave the exclusive power of establishing post-offices and post-roads to congress, thus preventing the difficulties which would have resulted from leaving this department to the several states.

17. "There is at the seat of government of the United States a general post-office, under the direction of the post-master general, who is appointed by the pre-

sident, and appoints two assistants, and such clerks as may be necessary for the performance of the business of his office. He establishes post-offices, and appoints post-masters at all such places as appear to him expedient on post-roads established by law. He instructs the post-masters, provides for the carriage of the mail, and directs the routes. "No stage, or other vehicle which regularly performs trips on a post-road, or a road parallel to it, shall convey letters, nor any packet-boat or other vessel which regularly plies on a water declared to be a post-road, except it relates to some part of the cargo, under the penalty of fifty dollars."

18. Robbery of the mail is punishable with imprisonment from five to ten years, and a second offence with death. Dead letters, or such as have remained in the post-office for a long time, without being called for, must be sent to the post-master general, at Washington, who opens them, and if they contain any thing valuable endeavors to return them to the owners.

19. The privilege of franking is an immunity from postage, which is enjoyed by certain officers of government and by members of congress. A letter is said to be franked when the name of the individual possessed of such privilege writes his name upon the envelope.

20. We have already mentioned that the mails are usually transported in coaches on the land route. Difficulties are often encountered by stage-drivers in the more unfrequented parts of the country on account of the badness of the roads or the swelling of rivers. Sometimes a heavy fall of snow obstructs the way, and sometimes a bridge has been broken by the ice and carried away. When these obstacles are finally overcome, the mail-bags are

established? 16. After the breaking out of the revolution—? 17. What of the general post-office? 18. The punishment for robbery of the

established? 16. After the breaking out of the revolution—? 17. What of the general post-office? 18. The punishment for robbery of the

safely delivered at the post-office and the letters and newspapers distributed.



21. The mode in which letters are carried in some parts of South America is curious. The postman who is the medium of communication between the coasts of the Pacific Ocean and the provinces which are situated on the east of the Andes, swims for two days down the river Chamaya, and through a part of the Amazon, carrying his bag of letters wrapped about his head, like a turban. There is scarcely an instance of the letters having been lost or even wetted.

22. "Great numbers of letters pass between America and Europe in the lines of packets, particularly those which run between New York and Liverpool and Havre, and are supported by the enterprise of private individuals in the United States. The number of letters delivered by these packets into the New York post-office, sometimes amounts, (when several arrive together in consequence of a continuance of contrary winds on the coast,) to many thousands in one day."

#### BOOK-KEEPING.

23. Book-keeping is the art of teaching how to dispose the accounts of business, so that the true state of every part and of the whole, may be easily and distinctly

mail? 19. The privilege of franking? 20. The difficulties of transporting the mail? 21. What curious mode of carrying letters is mentioned? 22. What of the transportation of letters between

known. Merchants' books are kept either by single or by double entry; the former method is used by retailers of merchandise, and the latter by merchants, wholesale dealers, &c.

24. The most considerable books, according to the Italian method of double entry, are the waste-book, the journal and the ledger; but besides these three, which are absolutely necessary, there are several others, called auxiliary books, which are used in proportion to the business a man transacts. These books are the cash-book, the bill-book, the invoice-book, the account-current book, the commission, or order, or advice-book, the letter-book, &c. all of which are more or less in use.

25. The *Waste-Book* contains a distinct record of all transactions and dealings, in the way of trade, related in a plain, simple style, and in order of time, as they succeed one another. It is ruled with two columns on the right hand, for dollars and cents. The several transactions are separated from each other by a line, in the middle of which, or on the left margin, the date is placed. The waste-book should contain a record of all the merchant's pecuniary affairs; and every occurrence that affects his stock, so as to impair or increase it, should be noted down. In it should be written under the date of each day, every transaction, whether of buying or selling, giving or receiving; noting well the persons, quantities, and prices.

26. The *Journal* is the book in which the transactions recorded in the waste-book are prepared to be carried to the ledger. It is in fact only the waste-book copied out, but the matters are stated differently. In the *Waste-book*, the several transactions are simply noted down, as

Europe and America? 23. What is said of book-keeping? 24. What books are used according to the Italian method of double entry? 25. What is the waste-book? 26. The journal? 27. The



you might enter them yourselves; but in the Journal, they are told in the merchants' peculiar language; such as you would hardly understand, till you should come to be accustomed to it. But it is so stated in *Debtor* and *Creditor* as to be the more readily transferred to the several distinct accounts in the Ledger; and in such a manner as to render the detection of errors more easy.

27. The *Ledger* is the principal book, wherein all the several articles of each particular account that lie scattered in other books, according to their dates, are collected and placed together in spaces allotted for them, in such a manner that the opposite parts of every account are directly set fronting one another, on opposite sides of the same page or folio.

28. The ledger's folios are divided into spaces for containing the accounts, on the head of which are written the titles of the accounts, marked *Dr.* on the left hand page, and *Cr.* on the right; below which stand the articles, with the word *To* prefixed on the *Dr.* side, and the word *By* on the *Cr.* side; and upon the margin are recorded the dates of the articles, in two small columns allotted for that purpose. The person who owes me any thing is called my *debtor*: the person whom I owe is called my *creditor*: the *balance* is the overplus or difference—so much as one side of the account exceeds the other.

29. I will now endeavor to explain to you some of those mercantile terms which you must often hear, but may not always understand. A *bill of exchange* is a security, originally invented among merchants in different countries for the more easy remittance of money from the one to the other. It is an open letter of request, from one man to another desiring him to pay a sum mentioned therein, either to

his own order, or to a third person, on his account; by which means a man at the most distant part of the world may have money remitted to him from any trading country. In common speech, such a bill is often called a *draft*. The following may be the form of a bill of exchange.

"New York, March 11, 1832.

\$500.

"Twelve months after date, pay to Mr Francis Freeport, or his order, five hundred dollars, for value received, and as advised by  
Laurence Long.

To Messrs. John and William Bull,  
London, England."

30. This expression, "as advised," intimates that Mr. Long would write them word concerning this settlement, and that they would be expected to honor, or, in other words, to pay the bill exactly at the time appointed. When a bill is presented at the proper time, and the money is not paid, it is said to be *dishonored*.

31. To use this bill, Mr. Freeport must find somebody who owes as much money in London. Instead of sending that cash across the Atlantic, he will pay him \$500; Freeport will then give him this bill; and the latter will send it to London, to the person to whom he owed the money, who will present it at the proper time to Messrs. Bull, and will receive the amount. So all parties will be accommodated, without running the hazard of losing the cash itself in the voyage, although some difference may exist by the value of money being greater in one place than in the other.

32. Transactions of this kind are generally managed by persons called exchange brokers, who, being acquainted with the different merchants abroad and at home, can give the information which may be

ledger? 23. How is the ledger arranged? 29. What is a bill of exchange? 30. What is meant

by the honoring or dishonoring of a bill? 31. To use this bill what must be done? 32. By whom

wanted, for which they are paid at a regular rate.

33. An *invoice* is an account of goods or merchandise shipped by merchants for their correspondents abroad, in which the peculiar marks of each package, with other particulars, are set forth. The prices, duties, and charges of every kind upon them are recorded, and a book is kept into which they are duly copied.

34. A foreign *agent or factor*, is a person in some foreign land, employed by a merchant to transact business for him, whether buying or selling. For this trouble he has his commission; that is, so much per cent. on the amount of the business done.

35. The people who insure shipping and their cargoes are called *Underwriters*, and they make it their business to know what the hazards are in every sort of voyage. Now, if they know, by long experience, that in the trade to Europe, for instance, not above one ship in a hundred is lost; then, if they receive one dollar in the hundred for all they insure, they will, unless peculiar losses occur, be safe. And if they charge rather more than the average loss, they will gain a profit. Each man uses his wisdom and experience in such cases, and many gain great wealth thereby. In some cases, the insurance is much less; in others, it is more.

36. Insurance may be effected on many different kinds of property. Several insurance-offices have been established against loss by fire, losses at sea, and even against loss of life. The instrument, by which the contract of insurance is made, is called a *policy*. Policies of insurance on lives usually make an exception of death by suicide.

37. *Promissory notes* or notes of hand, are merely written promises to pay within a certain time the sums therein stated, either to a particular person, or to any person who may be the bearer of the note. A note is said to be *endorsed* when the name of some individual, who must be responsible for its payment, is written upon the back of it. The following is the form of a promissory note.

"Boston, 17th February, 1833.

\$150.

*Two months after date, I promise to pay to John Johnson, Esq. or order, the sum of one hundred and fifty dollars, for value received.*  
George Bale."

## CHAP. XXXVI.

### BANKS, &c.

1. A bank is a common repository, where many persons agree to keep their money, that it may always be at their call or direction. Banks are of three kinds, viz: of deposit, of discount, and of circulation.

2. A bank of deposit receives money to keep for the depositor, until he draws it out. Another branch of the banking business is the discounting of promissory notes and bills of exchange, or loaning money upon security.

3. A bank of circulation issues bills or notes of its own, intended to be the circulating currency or medium of exchanges, instead of gold and silver. Banks are also divided into public and private. In England, there is but one public bank, namely, the bank of England; whereas, in the United States, most of the banks are public, and, in some of the states, private banks of circulation are prohibited by law.

4. Banks are generally formed by a

notes?

1. What is a bank? How many kinds of banks are there? 2. What is a bank of deposit? Of discount? A bank of circulation? 4. How are

are transactions of this kind generally managed? 33. What is an invoice? 34. A foreign agent or factor? 35. What of underwriters? 36. What is a policy of insurance? 37. What of promissory



number of moneyed individuals, who, for carrying on the business of exchanging or dealing in bullion, money and bills, advance a considerable sum as a joint capital, which also forms a security to those who deposit money with them. The convenience of such institutions in facilitating commercial transactions, has caused them to be established in almost every city of Europe and the United States.

5. The bank of Venice was established about the year 1157, the bank of Genoa in 1345, the bank of Amsterdam in 1609, the bank of Hamburg in 1619, the bank of Rotterdam in 1635, the bank of England in 1694, the bank of Scotland in 1695, and the bank of France in 1716.

6. The old bank of the United States was incorporated by an act of Congress, in 1791. Its charter expired in 1811. The new United States bank at Philadelphia was chartered in 1816, with a capital of \$35,000,000. Branches, or smaller banks connected with it, have been established in the most considerable cities of the Union.

#### EXCHANGES.

7. An exchange signifies a place in most considerable cities wherein the merchants, agents, bankers, brokers, and other persons concerned in commerce, meet at certain times, to confer on matters of business. The most considerable exchanges in Europe are those of London, Amsterdam, Dublin, Bourdeaux and St. Petersburg.

8. The Royal Exchange of London was founded by Sir Thomas Gresham, in 1566. It was destroyed by fire precisely a century after its erection. The present magnificent structure was built in 1668, and cost 80,000 pounds sterling. There is an area, where the merchants meet every day at change, hours; and, for the more

regular despatch of business, they dispose of themselves in separate walks, each of which has its appropriate name. The Exchange is open every day from eight in



the morning, till half past four in the afternoon; but it is most frequented between one and three o'clock. The assembly is then very great, and the mixture of color, dresses, and language, is very amusing to one disposed to listen and observe.

9. The chambers over the area are occupied by Lloyd's Coffee-house and several public companies. Lloyd's Coffee-house deserves some description. It is the place where gentlemen who are called *underwriters* assemble; who agree to insure shipping from all the dangers of the seas, or rather to make good the loss, should any occur, on being paid a certain premium, in proportion to the value of the cargo, and the risk of the voyage. The principal merchants of the city belong to it. They usually have the first intelligence of every event which regards the shipping interest, all which is entered regularly in their books. The committee have often given rewards, with a liberal hand, to soldiers and sailors, and to their widows and orphans.

10. There are large vaults beneath, which are used by the East-India Company, as storehouses for their pepper.

banks generally formed? 5. What of the banks of Europe? 6. The United States Bank? 7. What is an exchange? 8. What of the Royal

Exchange of London? 9. Lloyd's Coffee-house? 10. For what purpose are the vaults of the build ing used? 11. What of the New York Exchange

11. The New York Exchange is handsomely built of white marble. It has four marble columns in front, made of single shafts. The exchange room is large, and resorted to by merchants between one and three o'clock. There is a telegraph on the top of the building, which communicates with another on Sandy Hook, and by this means the merchants receive early intelligence of the approach of their vessels. From the exchange are doors and passages leading to a commercial reading-room, and there are numerous newspaper and other offices within the edifice.

12. The Merchant's Exchange of Baltimore, built by private subscription, is a very large edifice, in form somewhat resembling the letter H. It has four wings—one for the United States Branch Bank, one for the custom-house, and one for a coffee-house. In the centre is the great hall, lighted from the dome, which is ninety feet from the floor.

13. It may not be inappropriate to mention here the bazaars of Asia. The word is Arabic originally denotes *sale or exchange*. Some are open, some covered with lofty ceilings or domes. At the bazaars, or in the neighborhood of them, are the coffee-houses, so much frequented in Persia, and other Eastern countries. As the Orientals live almost entirely out of doors, the bazaars of populous cities, besides their mercantile importance, are of consequence as places of social intercourse. The bazaar of Ispahan is one of the finest in Persia. At Constantinople are two bazaars—the old and new one. In the Oriental tales,—for instance, in the Arabian Nights,—the bazaars occupy a very conspicuous place. The word bazaar has been recently used in Europe; and there is one in London, which is large and well-frequented.

12. The Merchant's Exchange of Baltimore?  
13. What of the bazaars of Asia?

## CHAP. XXXVII.

### DOCKS, WHARVES, TELEGRAPHS, &c.

1. A dock is an artificial basin, by the side of a harbor, made convenient either for the building or repairing of vessels. In America the spaces between the wharves are called docks.

2. A *dry dock* is a place where the water is kept out by great flood-gates, till the ship is built or repaired, when the gates are opened, and the water let in to float and launch her. A *wet dock* is a place into which the ship may be hauled, out of the tide's way, and so dock herself, or sink for herself a place to lie in.

3. The docks of Liverpool were the first constructed in England; and many other seaport towns have been induced to follow her example. It is scarcely thirty years, since the whole of the vessels which entered the port of London were obliged to remain moored in the open stream of the Thames. The London docks were begun in 1800, and completed in 1805. Before



these docks were formed, all the cargoes of the shipping were exposed to the depredations of pilferers, to an immense extent. These goods were, of necessity, left on the various quays, when taken out of the ships; and it was not always possible to take them away immediately.

4. When it is considered, that more

1. What is a dock? 2. A dry dock? A wet dock? 3. What of the docks of Liverpool and



than thirteen thousand vessels come loaded to London every year, which discharge three millions of packages, some of them of great value, we may suppose the vast confusion of such traffic, which may give opportunity to the idle and dishonest to purloin, without the possibility of detection, to a very great amount. River pirates came in boats, and broke into the ships in the night; and some thousand pilferers were strolling among the landed goods upon the quays.

5. By unloading the shipping in these docks, the greatest part of this plundering is prevented: the docks are surrounded with high walls; they have no house adjoining, and are locked up every night, and well watched. It has been calculated that, by this means, goods have been saved to the value of 161,162*l.* in a single year.

6. There is also a marine police, established in 1798, which patrols the river with great care, whose vigilance cannot easily be evaded. Depredators are instantly apprehended, and magistrates constantly attend at the marine police-offices, to render speedy justice.

7. Many of the commercial cities of the United States give evidence of the enterprise and liberality of their merchants, in the neatness of their docks and the extent and regularity of their wharves. The United States Dry Dock, recently constructed at the Navy Yard, Charlestown, Mass., is an object deserving some attention. The Dock is 341 feet in length, by 80 in width, and 30 feet deep. It is capable of admitting the largest ship in our navy—viz. the *Pennsylvania*, the entrance of the dock being 60 feet across, and the width of that ship being 55 feet. Besides these, there is what is denominated the float-

ing gate, which weighs 300 tons. It is built like a vessel, is 60 feet long, 15 wide, and 30 in height—requiring about 19 feet of water to float it. This is set in a groove outside of the other gates, filled with iron and sunk.

8. For emptying the dock of water, a powerful hydraulic apparatus is employed wrought by a steam-engine of 60 horse power. There are 8 lift pumps, each 2 feet 6 inches in diameter, and discharging altogether, at every stroke, 12 hogsheads: there are also 8 chain pumps, 1 foot in diameter. The water is first forced from the dock into wells, then into a large reservoir, whence it runs into the sea. The weight of the steam-engine and machinery is about 122 tons.

9. The floating gate is said to contain timber enough to build a ship of 300 or 400 tons; and some 3 or 4,000 dollars' worth of sheathing and bolt copper have already been used upon it. The turning gates, at high water, sustain a pressure equal to about 800 tons.

#### THE TELEGRAPH.

10. The telegraph is a contrivance by which intelligence may be conveyed a great distance by means of visible signals. The art of conversing, between parties remote from each other, by certain signs, previously agreed upon, is very ancient. To make known that some expected event had actually happened, it was only necessary to kindle a fire on a high hill, and the intelligence was rapidly spread: but this sign must have been before agreed upon, or those who saw it might be uncertain what it meant. Now, by the telegraph, whole sentences can be rapidly conveyed, and a regular conversation can be kept up.

11. The telegraph used in Boston con-

London? 4. Before the construction of the London docks, were vessels liable to be robbed? 5. How is the plundering now prevented? 6. What of the marine police? 7. What of the docks of

the United States? The Charlestown dry dock? 8. How is it emptied? 9. What of the gates? 10. What of the telegraph? 11. The telegraph used in Boston? 12. Is a telegraphic dictionary

sists of an upright post or mast, about forty feet in height, having a small movable arm about six feet long and twelve inches broad, called the *indicator*; and two longer arms made of plank, each about ten feet long, and one foot broad, which are placed at different and convenient distances below the indicator, to carry on the communications. The indicator, and arms are colored black in order to be the better seen by day-light.—They may be placed, each in six different positions. The several positions denote the numerals from one to six, so that the two arms together may take twelve positions; and this number of positions by the familiar principles of change and combination, affords sufficient signs to express any numeral from one to many hundred thousands.

12. 'With the telegraph are used *three books* like dictionaries containing sets of numerals arranged in order, with the words denoted by these numerals placed by the side of them, exactly upon the principle of a dictionary of any language. The telegraphic dictionary only differs from any other, in having a list of *numerals* instead of words under each letter of the alphabet, with the meanings following the numerals; just as in a French dictionary, for example, the French word would be put first, and then the English signification following it. Now the arms of the telegraph being placed in certain positions, express particular numbers, the observer then looks for the number in his telegraphic dictionary, and by the side of it, he finds the word signified by it.'

13. There is another kind of telegraph which is used at sea, and which is of great use in conveying intelligence from one ship to another, or from the ship to the shore. A telegraph of flags has been invented, and called the 'Marine Telegraph.'

used? 13. What of the marine telegraph? 14. How many changes or combinations can be made?

The use of these flags rests upon the same principle with the signal arms of the land telegraph. They are six in number, and correspond to the six positions of the arms of the land telegraph denoting the numerals 1, 2, 3, 4, 5, 6: they are blue and white, and all of the same size, with duplicate numbers of each flag. To them is added a conversation flag, which like the indicator of the land telegraph, shows that the ship making this signal desires to converse.

14. Nearly ten thousand changes or combinations can be made, designating words and phrases. By this means ships at sea can communicate with each other, even at the distance of several miles, and when they approach the coast, can hold correspondence with the land telegraph.

#### LIGHT-HOUSES.

15. A light-house is a building erected upon a cape or promontory on the sea-coast, or upon some rock in the sea, and having on its top, in the night time, a great fire, or light, which is constantly attended by some careful person, so as to be seen at a great distance from the land. It is used to direct the shipping on the coast, that might otherwise run ashore, or steer an improper course, when the darkness of the night and the uncertainty of currents &c., might render their situation with regard to the shore extremely doubtful.

16. Lamp lights are, on many accounts, preferable to either coal fires or candles; and the effect of these may be increased by placing them either behind glass hemispheres, or before properly disposed glass or metal reflectors, which last method is now very generally adopted.

17. The most remarkable light-house ever erected is perhaps the famous Eddystone Light-house. It is built on one of the rocks of that name, which lie in the

15. What is a light-house? 16. What kind of lights are used. 17. What is the most remarka-



English Channel, about 14 miles south-west from Plymouth. As these rocks were not very much elevated above the sea at any time, and at high water were quite covered by it, they formed a most dangerous obstacle to navigation, and several vessels were every season lost upon them.

18. Many a gallant ship, which had voyaged in safety across the whole breadth of the Atlantic, was shattered to pieces on this hidden source of destruction, as it was nearing port, and went down with its crew in sight of their native shores. It was therefore very desirable that the spot should, if possible, be pointed out by a warning light. But the same circumstances which made the Eddystone rocks so formidable to the mariner, rendered the attempt to erect a light-house upon them a peculiarly difficult enterprise.

19. The first attempt to erect a light-house on the Eddystone rocks was made in 1696; and it took four years to complete the structure. The architect felt so confident in the strength of the building, that he frequently declared, his only wish was to be in it during the greatest storm that ever blew under the face of the heavens, that he might see what would be the effect. On the 26th of November, 1703, he was in the light-house superintending some repairs, when there came on the greatest tempest that was ever known in England. Next morning not a vestige of the light-house was to be seen. It had been swept into the deep from the foundation; not a stone, or beam, or iron-bar remaining on the rock. The single thing left was a piece of iron chain, which had got so-wedged into a deep cleft that it

stuck there till it was cut out more than fifty years afterwards.

20. Such was the end of the first Eddy stone Light-house. Soon after, a vessel returning from Virginia, was lost on the rocks, when the greater part of her crew perished.

21. In 1709, another light-house was completed; and this building, notwithstanding some severe storms which it encountered, stood till December, 1755 when it was destroyed by fire.

22. In 1759, another light-house was erected by a celebrated mechanic, named Smeaton. This light-house is made of stone, and is a round building, gradually decreasing in circumference from the base up to a certain height, like the trunk of an oak, from which the architect states that he took the idea of it.

23. Among many other tempests which it has endured unshaken, was one of extraordinary fury, which occurred in the beginning of the year 1762. One individual, Smeaton tells us, who was fond of predicting its fate, declared, on that occasion, that if it still stood it would stand forever.

24. On the morning after the storm had spent its chief fury, many anxious observers pointed their glasses to the spot, where they scarcely expected ever again to discern it, and a feeling almost of wonder mixed itself with the joy and thankfulness of the architect's friends, as they with difficulty descried its form through the still dark and troubled air. It was uninjured even to a pane of glass in the lantern. In a letter from Plymouth upon this occasion the writer says, 'it is now my most steady belief, as well as every-body's here that its inhabitants are rather more secure

ble light-house yet erected? 18. What of the danger of the Eddystone rocks? 19. What of the first attempt to build a light-house on these rocks? 20. Did any more shipwrecks occur? 21. What was the fate of the second light-house?

22. When and by whom was the present one erected? 23. Of what is it built? 24. Has it withstood any violent storms? Is there now much doubt of its security?

in a storm, under the united force of wind and water, than we are in our houses from the former only.'

### CHAP. XXXVIII.

#### CUSTOMS, TARIFF, &c.

1. The customs or duties are the taxes customarily paid to the Government, upon the merchandise brought into the country or sent out of it. These vary according as distinct acts of Congress have given the right to take more or less upon the various articles of commerce. When goods are brought into the country they are said to be imported; when they are sent away, they are exported.

2. There is a custom-house in every port in the country, to which vessels come, to unload their cargoes. The customs are not gathered without a great number of officers to assist in the collection. As soon as a vessel enters the harbor from abroad, it is visited by a Custom-house officer, called a *Tide Waiter*, who continues on board till the ship arrives at its moorings. His business is, to see that no commodities are parted with, till all has been properly entered at the Custom-house, in order to have the duty paid on all the goods.

3. The endeavors to prevent smuggling, as it is called, occasions great numbers of officers, sailors, cutters, &c., to be kept on the constant look-out. This is sometimes called the *Preventive Service*. They have fast-sailing cutters, in which they go to pursue the vessels which they suspect to be loaded with contraband goods; and sometimes they have a battle on land with the smugglers.

4. Perhaps you do not know what smuggling may be. Goods are said to be smuggled when they are brought into the

country, without the lawful duty being paid upon them. People sometimes manage to smuggle goods of considerable value; and they usually land them in the



night time on some desolate and solitary coast.

5. The history of customs is a little curious, when we compare modern times with those of ancient days. In the time of Henry the Third, the customs of England on foreign merchandise did not amount to more than 75*l.*, for the whole of the summer of the year 1268. During the reign of Elizabeth, great exertions were made upon the seas; and the customs amounted to 50,000*l.* per annum. In 1641, in the middle of the reign of Charles I. they were increased tenfold, even to 500,000*l.* At the beginning of the reign of George III. their produce at all the ports of England was 1,969,933*l.* And in the year 1808, we find the customs and excise bringing in 27,787,000*l.*

6. The history of the building, too, may be noticed. In early times, the customs were taken on the quay, chiefly at Billingsgate, amid all the hurry and bustle of that noisy place. A custom-house was at length reared, for this increasingly important purpose. This was destroyed by the great fire in 1666; and the building which was

1. What of the customs or duties? When are goods said to be imported? When exported? 2. Is there a custom-house in every port, which

vessels frequent? 3. What of smuggling? 4. When are goods said to be smuggled? 5. What is said of the increase of customs in England?



erected in its place perished by fire in 1814, when great confusion was occasioned by the burning of books and papers; and much loss sustained by the destruction of valuable property therein deposited, consisting of pearls and other costly articles.

7. A new and much larger building was then raised. Many houses were purchased to obtain room, at the expense of more than 40,000*l.*, the whole expense of the building being 255,000*l.* The front measures about four hundred and eighty-eight feet, and its depth is one hundred and seven feet. This building was opened for business in May 1817. But in 1825, the central part of the building gave way, not having been properly supported, and the *Long Room*, as it is called, fell in.

8. The Long Room is the principal public room for business; it is one hundred and ninety feet long, fifty-six feet wide, and fifty-five feet high. The floors are now of stone, and the doors which separate the apartments are of iron, to prevent, in future, accidents by fire.

9. Entering by the grand staircase at the end, you come through the lobbies, to this busy Long Room. Here the numerous clerks are employed with their huge books, keeping account of every vessel coming in or going out of the port; reckoning up the amount of the various duties to be paid, and signing and delivering the documents to authorise the landing, and examining the cargoes of the ships which have made a due report of them, in order to distribute their contents to the various merchants; or of such ships outward-bound as are clearing outwards, having paid all their dues, and intending to depart for their several foreign destinations.

10. The total value of imports into the

United States for the year 1832 was \$101,029,266, of which \$10,731,037, were in foreign vessels. For the year preceding, the total value of imports was \$103,191,124.

11. The total value of the exports for the year ending September 1832, was \$76,176,943: that of those of the preceding year was \$81,310,583. The domestic articles exported amounted to \$63,137,172, and the foreign to \$24,1039,473.

12. A *tariff* is a table or catalogue, containing the names of different sorts of merchandise, with the duties to be paid, as settled by authority amongst trading nations. The tariff of the United States has been subjected to alterations from time to time, as the wants of the people demanded.

13. I will now undertake to explain to you some of those terms connected with custom-house matters, which you may often hear, but may not always understand. A *drawback* in commerce, is an allowance made to merchants, on the re-exportation of certain goods, which in some cases consists of the whole, in others of a part, of the duties which had been paid upon the importation.

14. Debenture is the certificate delivered at the custom-house, when the exporter of any goods or merchandise has complied with the regulations, in consequence of which he is entitled to a bounty or drawback on the exportation. This certificate is signed by the officer of the customs when the goods are regularly entered and shipped, and the vessel is cleared out for her intended voyage.

15. An *embargo* is an arrest on ships or merchandise, by public authority; or a prohibition of state, commonly on foreign ships, in time of war, to prevent their go-

6. The history of the building? 7. The new one? 8. The Long Room? 9. What of the employment of the clerks? 10. What was the total

value of imports into the U. S. for the year 1832? 11. Of exports? 12. What is the meaning of tariff? 13. A drawback? 14. Debenture? 15. Embargo?

ing out of port, and sometimes to prevent their coming in.

16. *Quarantine* is the period during which a ship, coming from a port suspected of contagion, or having a contagious sickness on board, is forbidden intercourse with the place where she arrives. The term is derived from the Italian *quarantina*, a space of forty days, because originally that was the fixed period for all ships under such circumstances. But the time of a ship's detention is now very various according to the exigencies of the case.

17. *Privateers* are fighting vessels fitted out by private persons, during war, wherein, at their own hazard, they plunder the enemy, chiefly attacking merchant vessels. They must have a commission from government, and must conform to all the rules of war, and the laws of nations. They pay a part of their prizes to government for this permission, and the remainder the owners divide among themselves, in such proportions as have been agreed upon.

18. 'The *public debt* is a debt contracted by Congress in behalf of the United States. This is done by an act of Congress, which authorizes the secretary of the treasury (or any other person, as the act may express) to borrow money, and issue certificates for the sum borrowed. The act expresses the whole sum to be borrowed, the amount of interest to be paid, and the time when the principal is to be paid. Books of subscription are opened in the principal cities, and any person who chooses to lend, subscribes. Each lender receives a certificate that he is a creditor of the United States for the sum by him loaned, which certificate conforms to the act authorizing the loan.

19. 'Of these certificates a registry is made at some of the branch banks of the

United States, as the practice now is; formerly there were loan-offices. Any person, who is the owner of a certificate can sell it; and in such case, he assigns his certificate to the purchaser. That certificate is produced at the bank, and a new certificate is issued to the purchaser.

20. 'Such transfers are made whenever, and as often as the owner chooses to transfer, and without any expense to the owner. The interest is paid quarterly at the bank to the person there registered as owner. This public debt is known by the general name of *stocks*. It always has a market value, sometimes above, and sometimes below, the nominal value. It is a subject of speculation, as any thing else may be, which is bought to be sold, on the expectation of profit.

21. Most of the nations of Europe have such stocks. Speculations are carried on in them to a surprising amount. Fortunes are won and lost in a day. The present public debt of the United States is less than four cents to each inhabitant of the United States; while the public debt of Great Britain, at present, is something more than twenty-five cents to each inhabitant of the whole world!

22. My young readers may frequently have heard persons talking about trading in the funds. The funding system is a method by which modern governments have sought to give security to public loans, and thereby strengthen the public credit. It was first used in England, and afterwards followed by all the other states, which paid attention to their credit. It provides that on the creation of a public loan, funds shall immediately be formed, and secured by law, for the redemption of the capital itself. This gradual redeeming

16. What of quarantine? 17. Of Privateers? 18. What of the public debt? 19. How are the certificates issued to the lenders? 20. Can such transfers be made as often as the owner chooses?

By what name is the public debt generally known? 21. Have most of the nations of Europe such stocks? What of the public debt of the United States? Of Great Britain? 22. What of the



of the capital is called the sinking of the debt, and the fund appropriated for this purpose is called the *sinking fund*.

23. Variations in the saleable value of the public funds at first were caused chiefly by political events, which were supposed to affect either the authority of those by whom the debts were contracted, or the means of paying them; but since their great increase has induced many persons to make buying, and selling shares therein a regular trade, the fluctuations of the current price in general depends principally on the proportion of buyers and sellers, and on the schemes and combinations in which they engage in support of their respective speculations.

24. The chief part of the public funds in England consists of perpetual annuities, or those debts on which a stipulated rate of interest is to continue to be paid, unless the principal should be redeemed; the other parts consist of annuities for a certain number of years, and life annuities.

25. The perpetual annuities are distinguished by different titles, according to the rate of interest they pay, or the time and purpose of their creation; and when government, by a new loan, contracts an additional debt, bearing a certain fixed interest, it is usual to add the capital thus created, to the amount of that part of the public debt which bears the same interest; hence we hear of 3 per cent., 4 per cent., and 5 per cent., consolidated annuities.

26. The practice of *stock-jobbing* is a kind of traffic carried on amongst persons who possess but little or no property in any of the funds, yet who contract for the sale or transfer of stock at some future period, the latter part of the day, or the next *settling day*, at a price agreed on at the time.

funding system? 23. What were the variations in the funds produced by? 24. Of what does the chief part of the funds in England consist? 25. By what titles are the perpetual annuities distin-

Such bargains are called *time bargains*, and are contrary to law; and this practice is gambling in every sense of the word. It is, however, carried on to a great extent.

27. The terms, *bulls* and *bears* originated in the London Stock Exchange; as they are often in the mouths of people, it may be well enough to know their signification. Bulls are buyers, and bears sellers. In New York, a traffic in Bank Stock is often carried on, in which these words are used.

28. A *Mint* is a place where money is coined by the authority of government. The word *coin* is from the French language, and signifies a stamp. Our gold, silver and copper money is thus derived. Congress establishes the proportions of pure metal, and of alloy, and the weight of the mixture, which makes any piece of money.

29. The treasury of the United States buys the metal, causes it to be tried at the mint, and prepared in the circular form in which we see it. The pieces are then placed under the action of powerful machinery to be coined or stamped. The money is paid out by the treasury and so gets into circulation. Banks and individuals may have bullion coined at the mint. The United States mint is at Philadelphia.

30. Congress have the power of securing to the authors of new and useful inventions, or improvements, an exclusive right of making, using or selling them for the term of fourteen years. This object is effected by petitioning for a *patent*, and sending with the petition a description of the invention or improvement.

31. A patent, unless it be for a frivolous or useless object, is always granted when applied for; and an infringement of it may be prosecuted by the patentee.

guished? 26. What is said of the practice of stock-jobbing? 27. Of the terms, bulls and bears? 28. What is a mint? 29. How is the coin issued? 30. What of patents?

## A CONCISE HISTORY OF COMMERCE.

## CHAP. XXXIX.

1. I have drawn up a History of Commerce, that you may see the course it has taken among the nations, the vast benefits it confers, and how much better a medium of power it is than conquest and the sword.

2. The first hint we have of distant nations trading together, appears in the book of *Genesis*, chap. xxxvii. 25, when the cruel brethren of Joseph sold him to a caravan of Ishmaelites, who were conveying their precious commodities into Egypt, as spicery, balm, and myrrh. They are called *Midianites*, v. 36. The country of Midian is part of Arabia, south-east of the Dead Sea. They were going through the land of Canaan to Egypt, which was then a highly cultivated kingdom. The myrrh was the produce of Arabia, and the balm was of Gilead, through which they had travelled. But the spices intimate that the Arabians had, very early, nautical connexion with the country we call India, where chiefly the finer spices grow; if so, commerce, in its widest meaning, must have been better cultivated than we are apt to suppose. Certainly the shores of Arabia, on the Indian Ocean and Red Sea, must have given great facilities to mercantile enterprises.

3. The central situation of Egypt has made it always the emporium of commerce. By caravans the treasures of Asia and Africa were brought thither. Trade was at all times in esteem, because of the wealth it brought. But of the maritime trade of the Egyptians we have no regular account; for they neglected the sea superstitiously for many ages. Their own productions, among which corn was in great

abundance, their numerous arts and manufactures, enabled them to purchase from neighboring nations, and by making the commerce reciprocal, they made it also gainful. The advantage of navigation by the Nile was not neglected by them; their internal trade, which distributed the luxuries thus obtained, gained great facility for transporting them from Rameses to Syene, by means of this lordly river. The riches and power once enjoyed in Egypt, have left imperishable testimonials to the present day, in its massy buildings, and splendid ruins of temples and tombs. Commerce furnishes wealth in the most quiet, honorable, and abundant manner; and wherever wealth abounds, the country will be adorned presently. Convenience, pride, patriotism, will contrive many lasting modes of storing up this wealth, in comforts for the people, splendor for their rulers, and sacred edifices for their religion.

4. Tyre and Sidon, cities of Phœnice, washed by the Mediterranean, are next found rising into notice. Their country was nothing as to produce; industry alone made their rocks productive; and commerce, by feeding industry, was itself enriched. These people possessed but a small territory, a narrow and unproductive strip of land, and at length only a small island. They were beset on the land side by powerful nations, and could not enlarge their borders by conquest. The sea was open to them, and they achieved their victories on the briny wave. The ocean carried them to many countries bordering upon its shores, and gave them security from robbers in conveying their merchandise from port to port; for there was scarcely any other people who ventured

2. What is the first hint we have of the traffic

of distant nations? 3. What of the trade of



upon the open seas. Sidon is called *great*, and Tyre *a strong city*, so early as the time of Joshua. (Chap. xix. 28, 29.)

5. Commerce is the mother of many inventions, and affords the means of bringing them to maturity. The Phœnicians were obliged to count, in order to value their riches; they are said to have been the inventors of arithmetic. No mercantile concern can be conducted without this simple but wonderful science.

6. Joshua, in his conquest of Canaan, disturbed the Phœnicians, many of whom fled, finding they were not able to resist him. Tyre and Sidon could not contain all the refugees; numerous colonies were sent out by the Phœnician merchants, to various places, on both sides of the Mediterranean; by which means their own traffic was extended and secured. Two pillars, erected in Africa, near the straits, had on them inscriptions in Phœnician letters, intimating, that the people who came there had fled from 'Joshua the robber,' as they called him. This was in the twenty-sixth century of the world's age, or fifteenth before Christ.

7. About eleven hundred years before Christ, in the time of David, the Phœnicians, in the true spirit of commerce, continually extended their voyages; not content with the Mediterranean Sea, they passed the pillars of Hercules, two mountains so called, one on the shore of Spain, the other in Africa, and ventured into the Atlantic Ocean, and established peaceful settlements for trade, wherever they went. They found the inhabitants of what is now Andalusia, in a fruitful country, with plenty of gold, of which, indeed, their common utensils were made; and one of their ships was so overloaded with silver, that they had a dangerous voyage home. The

Phœnicians formed a settlement on an island called by them *Gadir*: the city is now called *Cádiz*.

8. The Israelites were an inland people, and never famous for maritime affairs. David raised his kingdom by conquests. When he wanted cedar to build him a house, he applied to Hiram, king of Tyre, with whom he lived in amity, and who sent it by sea. From the same king he obtained workmen also, for his buildings.

9. Solomon saw the advantage of commerce, and employed his wealth in endeavoring to obtain a share of it. Hiram, king of Tyre, assisted him with ship-builders and seamen. They built their fleets at a port on the Red Sea. The ships sailed to Ophir, which seems to have been on the eastern coast of Africa; and they brought back gold, silver, ivory, curious woods, apes, and peacocks. They were three years on their voyage; and many have thought they sailed all round Africa, and returned home by the Mediterranean. One voyage to Ophir brought him in two millions of our money, in gold only. Solomon had also great traffic with Egypt, from whence was brought merchandise not only for his own supply, but also for the king of the Hittites, and the kings of Syria. (1 Kings, x. 29.) Chariots, horses, and fine linen were the chief commodities thus obtained. His wealth and splendor, as much as his wisdom, raised his fame, and spread it far and wide; so that the queen of Sheba was drawn to visit him. The gold she gave him was worth above £600,000 sterling; besides which, she brought him precious stones, and such spices as had never before been known; perhaps, nutmegs and cloves from the Eastern Isles.

10. The grandeur to which Israel rose,

Egypt? 4. Tyre and Sidon? 5. The Phœnicians? 6. Joshua? The inscription on the two pillars? 7. Where did the Phœnicians extend their com-

merce? What settlement did they form? What is it now called? 8. What of the Israelites? 9. Solomon? Ophir? The visit of the queen of

during the long and peaceful reign of Solomon, sank as rapidly under his son Rehoboam. The loss of ten tribes reduced the kingdom of Judah greatly, although it continued respectable a long while. As concerns commerce, we see Jehoshaphat, eight hundred and ninety-seven years before Christ, endeavoring to revive it, but his ships were wrecked, and the design totally failed.

11. About eight hundred and sixty-nine years before Christ, we have reason to place the arrival of Elissa, called also Dido, in Africa, and the building of Carthage, whose commercial transactions became famous throughout the civilized world, and whose prosperity was long illustrious. This was a Phœnician colony; and we may remark, that those whom they sent out came peaceably, as merchants, with property for trade, and became beneficial to the several countries where they settled. Colonies sent out by other nations were armed bands of robbers, who went to plunder and destroy, and were therefore the terror and ruin of the subjugated inhabitants.

12. Carthage rose to great wealth, and flourished for seven hundred and twenty-four years. She planted many colonies; till changing her mercantile character for a military one, she wrought her own ruin. All around her in Africa, in Spain, at New Carthage now Carthagenæ, in Sicily, and the neighboring islands, her dominion was owned: but it was an iron sceptre she wielded, which, by oppressing, irritated her subjects, who applied to Rome for assistance. Rome was then beginning to domineer, and was glad of an invitation to carry her arms beyond Italy. The consequence was long and desperate wars with Carthage, called *the three Punic wars*; in the last of which, Carthage was complete-

ly destroyed, B. C. 146. During the first Punic war, Carthage contained seven hundred thousand inhabitants: at its destruction, scarcely five thousand were found in it.

13. They had traded through the Straits northward to Tartessus, or Cadiz, and to the Scilly Islands, adjacent to Cornwall, in England, called then the Cassiterides, for tin; and southwards, along the coast of Africa, to a considerable distance: Kerne, now Mogador, being a central emporium for them. Their most flourishing time was about four hundred and thirty years before Christ.

14. The account of Carthage is, indeed, but a branch of the history of Tyre and Sidon, from which the Carthaginians were a colony. The power of Tyre was so great, that when the city was attacked by Salmanasar, king of Assyria, with a vast army, and also a fleet of seventy vessels, the Tyrians, with only twelve ships, defeated them entirely, and took five hundred prisoners.

15. The ships of that period seem to have been little better than open boats. Corinth, about the year 700 B. C. distinguished itself as a maritime power, and built ships with triple the numbers of rowers in three ranks or tiers.

16. We may notice here a circumstance which was then thought dreadful, a storm in the Mediterranean, which drove Colæus of Samos (who was steering for Egypt) along its whole length, and through the Straits, presenting to his astonished eyes the wide Atlantic. He came then to Tartessus, on the western coast of Spain. Here he traded to great advantage, and returned to Greece immensely rich.

17. In 607, Necos, king of Egypt, sent a fleet down the Red Sea, which, coasting the whole of Africa, returned by the

Sheba? 10. What of Israel? 11. Carthage? 12. Its wealth? 13. Commerce? 14. Tyre? 15. What of

Corinth? 16. Colæus of Samos? 17. Necos, king of Egypt? 18. Tyre? 19. What did Alexander



Mediterranean. Those voyagers reported, that they had seen the noonday sun at their right hand, or north of them. This, which proves to us that they actually sailed round the whole of Africa, seemed at that time so unaccountable, that Herodotus, who tells us of the voyage, says he cannot believe it.

18. It is about the year 588, B. C. that we may place the great splendor of Tyre, of which we have an account extremely interesting, in the 26th, 27th, and 28th chapters of Ezekiel's prophecy; where we find the rich supply brought to that famous city, whose merchants were princes, whose pride made her say, "I sit as a queen, and shall never see adversity." The whole is extremely interesting, and worth reading, as a correct display of the commerce of that period and of that region; although its length makes it unfit to be here transcribed. We find the common consequences of great wealth, luxury, pride, and sins of the grossest names resulting to the Tyrians. These will draw down the vengeance of God upon any nation; and we need not wonder at the threatenings which accompany this description. The judgments here denounced came upon them partly by the overwhelming invasion of Nebuchadnezzar, from 585 to 572, and more completely by the arms of Alexander in 332, B. C. We see at this day the fulfilment of it; for Tyre is now bald as the top of a rock, a place for fishermen to dry their nets.—(*Ezekiel*, xxvi. 14.)

19. The Phœnicians, by Tyre, kept the command of commerce, till Alexander destroyed it, about 332 years before Christ; and it was still the Phœnicians, who, by Carthage, commanded and enlarged the sphere of commerce, till its final destruction by the Romans. During the declension of these maritime cities, several of

the Grecian states increased in their attentions to the sea; but it was more as a theatre for warlike dominion, than for the peaceful purposes of commerce. Athens held this power long; and, after her, Sparta: in both cases, their tyranny provoked resistance, and entailed ruin.

20. The next grand movement which gave a new turn to commerce, arose from the wise foresight of Alexander; whose aim seems to have been not more to conquer by land than by sea. Wherever he gained a footing, he made provisions for trade. He also planned voyages of discovery; and with the view of giving a centre to commerce, easy of access to the whole known world, he built the city, called, after himself, Alexandria; having connexion with the west by the Mediterranean, and with the richer provinces of the East by the Red Sea, while caravans from the central countries of Asia could reach it by the isthmus of Suez.

21. Ptolemy, one of Alexander's generals, obtained Egypt as his share of the conqueror's spoils. He with eager assiduity carried into effect his master's plans for commerce, and drew great numbers to settle in Alexandria. He built another city, called Berenice, far towards the south, on the Red Sea; at which all the precious commodities of the East obtained in Arabia were landed. He formed a road from thence to the Nile, down which river, all was brought to Alexandria. He kept also large fleets, both in the Red Sea, and in the Mediterranean, which gave his subjects a great superiority over the decaying citizens of Tyre. His revenues produced by this wise policy were not only immense, but peacefully gained; and they promoted happiness on all hands.

22. We may mention the Sabæans in the south of Arabia, with whom the carry-

ing-trade between India and Egypt seems to have flourished for ages; for only with them did the Egyptians trade, even under the Ptolemies. They were settled in a happy land, fertile, and well-stored with cattle, abundant in fragrant gums, myrrh, frankincense, &c. Their ships went to India and the island; and their caravans to Syria and the ports of the Phœnicians; while their country, by its situation out of the reach of hostile armies, enjoyed continual peace.

23. We have noticed the pitiable fall of Carthage under the unrelenting Romans, about one hundred and forty-six years before Christ. The Romans were ignorant of the value and merits of commerce; and, as if they were determined to root it out, they, about the same period, destroyed Corinth the wealthy, which had been one of the most commercial cities of Greece. It was the very centre of Grecian art; and the statues and pictures carried thence to Rome gave that barbarian people their first notions of refinement. The total stagnation given to commerce, produced by the ruin of those two states, was felt all around; the labors of the industrious and the ingenious were useless, for there was no market for their productions; and the mariners, deprived of their legitimate employment, became pirates. They soon were masters of the sea; and the Romans were obliged to fit out great armaments, under Pompey, who, attacking them at once in their different stations, reduced them with great slaughter.

24. The adorning of Rome with statues and pictures, the visits of its generals to scenes of Asiatic splendor, with the wealthy and curious spoils they brought home, had the effect of rendering the hardy Romans luxurious. Another effect

of the wealth obtained, and the influence gained thereby, was to put away, in a great measure, the desire to have their country rule over all nations, and to rouse in their generals a wish to rule over their country.

25. The first who succeeded completely in this endeavor was Julius Cæsar. As a conqueror, he has had his full share of fame; his influence on commerce may be noticed, as he, in one year, restored both the ruined cities of Corinth and Carthage, which in time regained considerable importance.

26. The Roman emperors soon reduced Egypt to the state of a mere province of the empire; and, now that the whole world around the Mediterranean, and far into Asia, was under their dominion, they, for their own sake, began to favor commerce. Corn was the grand object of their solicitude, that their metropolis might be in no danger of starving.

27. Italy itself produced great supplies; Cisalpine Gaul sent them pork salted; tapestry and woollen goods came from Padua, and marble was fetched from the Alps, for their sumptuous buildings. Ice, to cool their liquors, became almost a necessary of life. Liguria sent them large timbers, hides, and honey. Pisa furnished them with huge blocks of marble, cheeses of vast size, and wines of exquisite flavor. The islands supplied them with timber; and Sicily sent immense stores of corn. Melita sent fine clothing; Greece furnished them with honey, the purple dye, and a fine stuff called *Byssinus*. Paros had marble for statues; Samos, fine earthenware; Lemnos, vermilion; and Cos, an extremely transparent drapery.

28. Thrace sent them corn, and the salted tunny-fish; and from Colchis they received fine wool, and linen of Egyptian

Corinth? 24. What tended to render the Romans luxurious? 25. What of Julius Cæsar? 26. The Roman dominion? 27. What articles of

luxury did they receive from the different countries under their sway? 28. What was sent them from Thrace? Asia Minor? Tyre and Sidon?



fabric. East India commodities came overland to Phocis, on the Euxine Sea, from whence they were shipped to Rome. From the southern provinces of Asia Minor came curious marble, wine, wool, vermillion, and cheese. Tyre and Sidon, once so famous, now only furnished glass, which had been there invented. Egypt was long called the granary of the world, and Rome almost depended on a regular supply of corn from thence. Its famous linens and flax were in high request, as were its cotton goods, perfumed ointments, gums, and papyrus. Also, large quantities of Indian goods came through Alexandria, which was carefully fostered, and grew rapidly in importance and in splendor. Africa Proper, that is, the Roman province on the northern coast, supplied them with corn, drugs, and ostrich feathers; as also with elephants, lions, and other wild beasts, for their savage spectacles.

29. From Mauritania came a wood of great price, somewhat like our mahogany. Their provinces in Spain, especially the southern, were like one gay garden, adorned with elegant buildings. The mines of gold beneath the soil, and the excellent productions above, supplied the imperial city with many of its choicest luxuries. Gadir, Gades, or Cadiz, was a grand storehouse to the west, almost rivalling Alexandria in the East; while the vast provinces of Gaul, furnished by inland navigation to the ports of Narbo and Massilia, (now Marseilles,) on the south, and Burdigala, (now Bourdeaux,) on the west, great quantities of provisions, metals, linens, and plaid garments, besides an extensive variety of minor articles.

30. This influx of every article to Rome can hardly be called *commerce*, as the Romans exported nothing in return, except money; the gold and silver which they

had exacted as tribute, or obtained by plunder, were thus returned to the various provinces. Indeed, with the Romans, the character of a merchant was in no esteem; they left it to their enslaved subjects, thinking nothing honorable but the sword.

31. In this manner did all the provinces pour into Rome their choicest productions; ruining, by the luxuries they afforded, that domineering power which had ruined them by the sword. A few particulars may be remarked, before we come to any change, which can deserve to be noted in this sketch of the history of commerce. Commerce was never cultivated by the Romans; it lived by its own energies, in spite of them; they only, for their own advantage, seized on the precious fruits obtained by it, and brought within their reach.

32. The next great change was in the empire itself, which sank under its own weight. The removal of the seat of government from Rome to Byzantium, by Constantine, in A. D. 328, however favorable or necessary to keep up the dominion of the eastern provinces, was fatal to the security of the western parts. It issued in there being often two or more emperors; and at last, in weakening these parts, distant from the head-quarters so much, that the tribes from the northern nations, generally called *Goths*, by frequent and incessant irruptions, at last prevailed. Odoacer removed Augustulus, the last who bore the title of emperor in Italy. Soon after, Theodoric, king of the Ostrogoths, defeated Odoacer, and became king of Italy. He was a wise and excellent prince, under whom peace and plenty again spread over the desolated plains of Italy, and arts and commerce began again to rear their smiling heads.

33. Africa had been rent from the Ro-

Egypt? 29. What came from Mauritania? 30. What did the Romans export in return? 31. Was

commerce much cultivated by the Romans? 32. When, and by whom, was the seat of govern

man power, by the Vandal king, Genseric, who became master of the sea; and from Carthage issued forth with his barbarian hordes, sacked Rome itself for fourteen days, and carried off to his own city the spoils of all the earth, which had for ages been accumulating at Rome. Spain was almost occupied by two Gothic tribes. Gaul was overrun by the Franks, a German nation; and Britain had been treacherously gained by the Saxons.

34. The Eastern empire itself soon began to decay, although it continued a waxing and waning existence for some centuries. Commerce still flowed through some of its old channels in Asia and Egypt to Constantinople, but in a very reduced state.

35. Commerce, which had risen to a broad and deep river, under the Phœnicians and their descendants at Carthage, had become stagnant under the military oppression of the Roman republic; it had flowed in a gentle stream at the command of imperial luxury; then it was, by the Gothic irruptions, dispersed and lost as the Rhine vanishes in the sands. We may now begin to trace its reappearance; small indeed at first, but gradually rising, spreading, and fertilizing every land on which it touched.

36. Before, however, we trace its rise in these western parts, let us give another glance at it, in the decaying empire of the East. The commerce of the Egyptians with India was totally failing, the Indians themselves becoming the chief merchants. These, in their voyage from India, usually called in their way at the Persian ports; where frequently they sold the whole of their cargoes. This brought on a deficiency of trade to the Red Sea, or rather to the king of Abyssinia's domin-

ions, through which the Romans had been accustomed to obtain Indian commodities; and, at the same time, it threw into the hands of the Persians this important and enriching commerce. The Persians knew well how to make their advantage of this monopoly. That luxury which was fast bringing the Roman empire to ruin, was insatiable in its demands. Silk was one grand article of display; and the price it bore in coming through the hands of the Persians, caused great distress and puerile lamentations at Constantinople.

37 It was at this time that a couple of monks, who had travelled to China, and staid there long enough to learn the whole business of managing the silkworms, brought to Constantinople a number of the eggs of these valuable insects, concealed in the hollow of their canes; and thereby stocked the West with a material, now of incalculable value, both to the rich who wear, and to the poor who manufacture it.

## CHAP. XL.

1. In the middle of the fifth century, the Turkish power began to rise, and interrupted the caravans which were accustomed to pass between China and Persia: thus, in the issue, producing a trade from China to Constantinople, passing north of the Caspian Sea.

2. In A. D. 616, Chosroes, king of Persia, took Alexandria from the Eastern Empire. As Constantinople had been fed from Egypt, this event tended to starve the imperial city, and the distress it occasioned roused the emperor Heraclius to something like old Roman vigor; he defeated Chosroes in 621, and recovered Alexandria. The Persians, during their

ment removed? 33. What of Africa? 34. The eastern empire? 35. Commerce under the Romans? 36. The commerce of the Egyptians?

37. The introduction of the culture of silk?

1. When did the Turkish power begin to rise?

2. What was the consequence of the capture



victories, had discovered that the Euphrates would form a more convenient medium of traffic to India; and they therefore built Bassora, which soon rose to great opulence.

3. The impostor Mohammed, with his furious Arabs, since called *Saracens*, or *horsemen*, began to spread desolation through the Eastern Empire, and to diminish its domains, by seizing province after province. Mohammed's successors carried on a war of extermination; impelled by religious zeal, and allured by the rich spoils and the feeble resistance of the Eastern Empire. They took Alexandria, and turned its vast supplies towards their own country of Medina. Their armies conquered from almost the borders of China, to the Atlantic Ocean; of course, all the trade of the world fell into their power. Cyprus, Rhodes, and many Grecian islands, submitted to their fury, and Carthage they utterly destroyed in 698. In 713 they established themselves in Spain.

4. The hatred between the Christians and these followers of Mohammed was so bitter, that it was thought to be heretical even to trade to Alexandria. But the Saracens, having so vast an extent of empire, and being undisputed masters of the Mediterranean, carried on a very considerable traffic among their own connected provinces.

5. Constantinople, it has been stated, carried on an inland caravan traffic even with China, distant as it was; and immensely dear must have been the silk thus obtained.

6. The first European power which rose to eminence in commerce was Venice. We must go back to state the rise of this important city. In 452, when Attila and his Huns descended like a torrent over

the northern plains of Italy, the distressed inhabitants fled every way for their lives. The Veneti, a people of one of those provinces, fled to a cluster of muddy islands, about five miles distant, in the Adriatic. The water between them and the continent they had left, was too deep to be forded, and too shallow for ships to reach them. Here they raised such huts of mud and weeds as they were able; they betook themselves to fishing for their subsistence, and to their poverty they owed the tranquillity and safety they enjoyed. The continued wars in Italy drove great numbers to take refuge in the same shelter.

7. In less than a century, that is, in 523, we find them formed into a state, with a regular government, and their tiny fishing-boats enlarged to mercantile crafts, which enabled them to carry goods up the several rivers around, when a season of peace would allow them to do so with safety. A writer of that day compares their city to a collection of nests of water-fowls. The distinction of rich and poor was not known; for all lived on the same fish-diet, and in houses alike poor; and they tied their boats to their walls, as landmen would tie up their cattle.

8. In 732, we find the Venetians venturing in ships beyond the Adriatic, into the Mediterranean, and even as far as Constantinople. As they had no land, all their energies were directed to the sea. As those who had settled among them had fled for liberty from their native soil, they were a people of spirit, activity, and enterprise; of course, they soon became wealthy and powerful. From Constantinople they brought cargoes of silks, purple draperies from Tyre, spices, and all the luxuries of the East. These were highly acceptable to the rising states of

of Alexandria? 3. What of Mohammed and his Arabs? 4. The hostility between the Christians and this sect? 5. The traffic of Constantinople

with China? 6. What European power first rose to eminence in commerce. 7. In 523, to what had they risen? 8. In 732, whither did they ven-

Italy, and to all the European powers, as far as they could find means to transport them to the northern and western parts.

9. In 813, some of the subjects of Charlemagne joined, to send ships to Alexandria; being the first Christians who ventured thither, after the Saracens had taken it. The Indian varieties they procured, were sent by the great rivers, into the heart of Germany, and all around.

10. For about a hundred and fifty years, the Saracens had pushed their conquests every way; and they now began to settle. The Caliph Almanzor, in 762, built Bagdad, as the seat of his empire, and called it the *city of peace*. As soon as these marauders had sheathed the sword, their active and intelligent minds made excursions into science and arts; by which some of the most important parts of our present knowledge were ascertained. They invented the arithmetical figures now in use; produced the alembic, for distillation; discovered the nature of acids and alkalies, and laid the ground-work for many of the sciences of the present age.

11. Their occupation of Spain was splendid. At a time that gross darkness obscured the faculties of the other parts of Europe, literature, science, and refinement, flourished in the Moorish cities of Spain. So that the European youth who were desirous of obtaining knowledge, went to their schools, and flourishing universities, to study. To their hardihood in thus venturing among Mussulmen, Europe owes the faint dawnings of science when it first began to rise.

12. The conduct of France, in 813, was imitated by Venice in 828; ten ships being sent to Alexandria, to trade, in spite of all laws to the contrary. In 1084, we find

the Venetians so powerful in shipping, that their assistance was earnestly requested by the Grecian emperor.

13. In 969, we find the inhabitants of Amalfi, in the kingdom of Naples, rivaling Venice, and obtaining great wealth, by trading all about the Mediterranean Sea, even to Constantinople. They afterwards obtained favor with the Saracen rulers; and, in 1020, had leave to build houses in the city of Jerusalem.

14. The notices of any thing like commerce in these ages, especially in Europe, are extremely scanty. We may suppose, that when any lucrative traffic was begun, its own importance gave it continuance; and this is indeed demonstrated; for, after awhile, we find it there still; and especially if it becomes much improved.

15. We may notice, because it is the beginning of an immense trade, that in 960 the manufacture of woollen cloths in Flanders seems to have been established. And Baldwin, Earl of Flanders, with great wisdom, set up weekly fairs in several of his cities, and exempted from duty all goods brought to them. The convenience of fairs obtained their establishment in many of the German cities.

16. We may also notice, because of its importance to commerce, that, in 970, Gerbert, overcoming every prejudice, went from France to the Moorish city of Seville, to study science at its purest source. From thence he brought the Arabic figures now in use, with the system and rules of arithmetic, at that time unknown in the Christian part of Europe. He became afterwards Pope, under the title of Sylvester II.

17. The Venetian republic continued to rise in power. In 993, they extirpated a nest of pirates on the coast of Dalmatia;

ture? 9. What of the subjects of Charlemagne? 10. When was Bagdad built? What was it called? What did the Saracens invent? 11. Did science flourish in the Moorish cities of Spain?

12. What of the Venetians in 1084? 13. The inhabitants of Amalfi in 969 and 1020? 14. What of the manufacture of woollen cloth in Flanders? 16. What of Gerbert? 17. Did the Vene-



and, seizing the country, obtained some considerable extent of territory.

18. In 1063, Pisa flourished as a commercial republic, trading even with the Saracens of Sicily. The people of Genoa were also trading largely in the Levant, or eastern part of the Mediterranean Sea.

19. In 1066, William the Norman, by the accidental death of Harold in battle, obtained possession of the crown of England. Whatever belongs to the history of English commerce will be more readily obtained from this period. During the Saxon reigns, war, and resistance to the Danes, was almost the sole occupation of the English. Agriculture had fallen greatly into disuse; many large territories, which in the Roman times had been cultivated, had become mere forests, or were overgrown with thick woods, harboring wild beasts and robbers, some even close to London. If little beyond necessary sustenance was raised, there could not be much to send to foreign countries.

20. That the people sold their own children, is known, by their being found and admired in the slave market at Rome; which was the occasion of Gregory's sending Augustine the monk to convert the Saxons, who were then all pagan idolaters. That fact alone will go far to prove their poverty, and that they had nothing else to sell. Yet the art of jewellery was so well practised, as to make English ornaments to be in high esteem, as early as the time of Alfred. And the work of small embroiderers in various colored silks, with gold and silver threads, was known abroad as English produce.

21. Great quantities of shipping were needed by William, to bring over his Norman army: it is most likely, that when he

was settled upon the English throne, much commercial intercourse took place between his Norman and Anglican domains. Yet it appears that most of the sea-ports had gone into decay.

22. The next principal spur to commerce arose out of the Crusades, or Holy Wars, as they were called, which began thus: From the time that the Saracens obtained possession of Palestine, Jerusalem, and all the places rendered famous in Scripture story, were almost shut up from the Christians. Much of the religion of that period consisted in a superstitious veneration for holy places; and when this difficulty came in the way, and Mohammedans ruled in that part of the country, the desire of going a pilgrimage to visit those places, and to kiss the relics there, became very strong. Much honor redounded to such as had been there; their devoutness was taken for granted; and much merit attached to the successful pilgrims.

23. The merchants of Amalfi had obtained leave from the Sultan of Egypt to build houses for their countrymen, and their religion, in Jerusalem itself; but still Christians, as such, were so despised and hated by the Mussulmans, that it was thought no crime, but rather meritorious, to insult, rob, and murder them, in their journey from the sea-ports where they landed, to the Holy City. An Order of Knights had been instituted on purpose for their protection; yet their sufferings were desperate, notwithstanding their aid.

24. In 1095, Peter the Hermit, as he was called, having been on this pilgrimage, and witnessed their sufferings, obtained leave from the Pope to preach up, through Europe, a holy war, the object of which

tian power continue to rise? 18. What of Pisa? 19. When did William the Norman obtain possession of the English crown? 20. What of their selling their children? 21. What was needed by

William to bring over his Norman army? 22. What other spur to commerce was there? 23. What of the hatred of the Mussulmans towards the Christians? 24. What was done by Peter

was, to rescue these sacred places from the hands of the infidels. Every soldier engaging in this service, had, as an ornament, a red cross upon the shoulder of his garment. The enterprise was said to be *the war for the Cross*; or, in a shorter term, a *Crusade*, or *Crusade*.

25. The Pope saw his advantage in it; as it tended to establish his authority in the East, where he had never been able to rule. He found it also likely to fill his coffers, as all who engaged in the crusade wanted pardons for all the sins they had committed before they went, indulgences for all they might feel inclined to commit in their sanguinary undertaking, and passports to Heaven for every one who should fall in the contest. All these things had their price, and brought him in vast wealth. The darkness of those ages, which had obscured the true nature of religion, and introduced superstitious works of merit in its stead, made every one, rich and poor, want to go, when the danger was no greater than in any other war, and the rich reward was Heaven itself. Add to this, as at that time there was in Europe but little commerce, and no manufactures, except in a few places, to employ the bulk of the population, the mass of the people, idle, and in want of employment, was turbulent, and ready for any mischief.

26. Most of the princes of Europe, therefore, were glad, by this means, to send out of their dominions multitudes of restless spirits, whom they with difficulty kept within bounds at home.

27. These hints may suffice to show how so strange a scheme as carrying all Europe eastwards, to war upon the Saracens, could ever obtain hold on the public mind, as it did for nearly two centuries.

28. This movement affected commerce

in many ways. It brought vast wealth to the few commercial cities existing, who alone had shipping sufficient to transport such immense armies to so great a distance, and supply them with subsistence when there. It was exactly the land of Indian and Asiatic luxuries and curiosities, and they came back laden with treasures, for which they found a ready market among the wealthy, all over Europe. Such of the Crusaders as returned, had seen a style of elegant accommodation among the Saracens, and the citizens of Constantinople, such as Europe had never known; but such as, for splendour and convenience, needed only to be seen to be desired.

29. A taste for things never before possessed, was thus generated; commerce was employed to fetch them, with the certainty of a ready market; and many manufactures in imitation, were set up in different cities. From this period, therefore, commerce took a spirited start, and aimed at a wider range; mere necessities no longer bounded men's wishes, but conveniences, elegances, and novelties, were every where sought after; and this desire is the moving spring of commerce.

30. Another important change in favor of commerce was occasioned by the Crusades; hitherto all towns were under some lord, whose tyrannical sway and galling extortions crushed the energies of the human mind, which never can act freely, except when it can ensure to itself the benefit of its exertions. Now, at this time, the eagerness of the feudal lords to distinguish themselves was cramped in most cases by their poverty.

31. They therefore sold to the citizens of their towns this right of domination and spoliation, for sums of immediate use to fit them out for their voyage. Cities

the Hermit? What was the enterprise called? 25. Was it favorably received by the Pope? 26. Why were the princes of Europe pleased with

the enterprise? 27. What do these hints show? 28. Did this movement affect commerce? 29. What were its consequences? 30. What other



and citizens began, therefore, to rise from their abject condition. The wealth they now could procure was their own, and became not only the means, but a stimulus, to greater exertions.

32. It may be added, that some of the great commercial cities, Pisa, and especially Venice, obtained from the Crusaders, during the time of their success in Palestine, streets in some cities, and even whole towns as colonies, as rewards for the assistance rendered by their shipping.

33. Pisa and Genoa contended for the sovereignty of the seas, and for the possession of the islands, by interminable wars. Genoa obtained by force, or purchase, much territory from the nobles, in the countries around their city.

#### CHAP. XLI.

1. In 1189, during the long reign of Henry II., of England, weaving was carried on to a considerable extent in England. The English goldworkers, and female embroiderers, kept up their reputation all over Europe.

2. The nature of the caravan trade in Asia may be seen by the account of one, taken by Richard I., when on his crusade. It was coming from Babylon to Palestine; both Saracen countries. Four thousand seven hundred camels, and an innumerable herd of mules and asses, were taken; and many others effected their escape; so that it was said, never was so much booty captured in one battle. It consisted of silk robes, cloaks, purple dye, and many personal ornaments; with money, and gold and silver in ingots, and candlesticks; coats of mail, arms, and weapons of all sorts; richly embroidered

change was effected? 31. What did the feudal lords do? 32. How were Pisa and Venice benefited? 33. What cities contended for the sovereignty of the sea?

1. What branch of manufactures flourished in

cushions, tents, and pavilions; with purses, medicines, wax, sugar, and spices.

3. As the discovery of the polarity of the loadstone has given new wings to commerce, by which she is enabled to fly across wide and trackless oceans, it is right to notice, that about the year 1200, it was first applied to navigation. The mode of discovering land, when out of sight,



used to be by birds carried on board for this purpose. Crows were then found very useful. If the bird returned to the ship, they were certain no land was near: but if the sailors saw it dart off, they followed in the same direction, and were sure of land.

4. But when the use of the magnetic needle was discovered, the mode of using it was, to let the needle float on a piece of straw, in a basin of water; they then set up a candle, so that this needle should point towards it; and esteeming that part the north, they steered accordingly. At the present day, this needle, kept in a box, is fastened to a card, which, being nicely balanced on a point, turns with great ease, by the mere power of the magnet; and shows the north, and all the other points of the compass, either by day or night.

England during the reign of Henry II.? 2. What of the caravan trade in Asia? 3. What was the earliest mode of discovering land, when out of sight? 4. What was the mode of using the magnetic needle? 5. By whom was it invented?

5. It is not accurately known, by whom the compass was invented. The English first suspended the compass, so as to enable it to retain always a horizontal position, and the Dutch gave names to the divisions of the card. The earliest missionaries to China found the magnetic needle in use in that country. Some land compasses are of the size of a watch-seal, and actually fixed in such seals; others are of the size and external form of a pocket watch. Sometimes a sun-dial is affixed to compass-boxes. The box, of whatever material it is made, must have no particle of iron in its construction.

6. In 1203, the Venetians transported a great army, chiefly French, to the Holy Land. They all stopped by the way to assist the Emperor of Constantinople. Some disagreements about the pay arising, they took the city, and made one of their leaders emperor.

7. The Venetians seized for themselves, as their reward, the whole of the Peloponessus, or Morea, with all its islands, riches, and silk manufactories, and part of the city of Constantinople itself. They purchased too, from one of the Crusaders, the whole island of Crete, or Candia. But they weakened their commercial power, by spreading it over so much territory. They obtained, however, entire command of all that Eastern commerce, of which Constantinople had been long the centre and storehouse.

8. Candia was, not long after, in 1206, taken by the Genoese: it was, indeed, soon recovered by the Venetians; but an incessant war between their rival republics was the consequence; so that all the wealth they gained in commerce, was lost in vain ambition. This war of merchants continued for nearly two centuries.

9. In 1216, died John king of England, whose wars with his nobles had induced him to court the towns and cities, by granting them many privileges. The towns flourished, and became populous and rich by trade; John obtained soldiers and wealth, and the people rose into liberty and independence.

10. We have been engaged hitherto, chiefly among the Southern parts of Europe, in countries bordering upon the Mediterranean Sea. We may now travel Northward, and observe a grand mercantile exertion in the heart of Germany, whose cities, upon or near the sea, confederated for mutual defence, under the name of *Hanse Towns*.

11. It seems, that even the nobles of Germany, having no regular employment, became banditti; robbing all whom they were able to overcome, to the great injury of the merchants trading from place to place. The citizens of Hamburg and Lubeck, by mutual agreement, established a guard to protect their commodities in passing from either of those cities to the other, in 1241. The convenience of this joint defence was soon manifest; so that it was adopted by other cities, who joined in the association, of which commerce was the only bond.

12. One after another, the maritime cities, not of Germany only, but of all the neighboring seas, entered into the confederacy; and in the issue, nearly all the commercial towns, even of France, Spain, and the South of Europe, joined this German league for mutual defence.

13. The confederates formed laws among themselves, and exercised a jurisdiction over all who belonged to it. They had a common stock, or treasury, at Lubeck; and kept warehouses in many principal

6. What did the Venetians do in 1203? 7. What did they take as their reward? 8. When, and by whom was Candia taken? 9. What took place

in 1216? 10. What were the Hanse Towns? 11. What of the nobles of Germany? 12. What other cities entered into the confederacy? 13



cities, as London, Bruges, Antwerp, Berg in Norway, and Novogorod in Russia.

14. This common feeling and common stock made them very powerful. As they were rich in shipping, princes hired their assistance, and made treaties with them. The same power enabled them to make war with such princes and states as gave them offence. They raised armies as well as fleets; took possession of provinces, and exercised sovereignty; though always with a strict view to the protection of their commerce. The kings of Denmark were repeatedly defeated by them. In 1428, they brought against the Danes two hundred and fifty ships, carrying twelve thousand soldiers; and dictated their own terms of peace.

15. This wealth enabled them to oblige crowned heads with considerable loans of money; and in return, they obtained many important privileges in their commercial transactions with the states of those princes, some of whom even declared themselves protectors of the Hanseatic confederation. Their deeds, their power, their wisdom, and their success, were viewed by all parties with great admiration. Though princes, in whose realms they had establishments, were at war with each other, yet the members of this league continued in peace, and their ships were unmolested. Their cities, though widely remote and under different governments, were yet held in strict and brotherly union, on the simple principle of commerce.

16. During the crusades, the Hanse Towns were of important service, both as to money, and shipping to transport the numerous armies towards the Holy Land.

17. That the power they had obtained should make them insolent, is only the natural effect of all power, when it rises

beyond control. Nor should it be wondered at, if such conduct, in process of time, awakened the jealousy even of those sovereigns who had once, for their own convenience, fostered the confederation. Great privileges had been allowed them in England, by Edward I., and which were of service for awhile; but as they produced almost a monopoly of the English trade, their immunities were curtailed under Edward VI.

18. A great blow was also struck at them, by Sir Francis Drake, in the time of Elizabeth: in 1589, he found sixty of their ships in the Tagus, loaded with corn for Spain, which was projecting the grand armada against England; and he took it all away as contraband, though he did no damage to their vessels. They complained of this to the Empire as an outrage; but the queen justified the conduct of her admiral, though the German states resented it.

19. So flourishing were they, and, in the course of two centuries, so formidable had they become, that a powerful league against them began to be negotiated. In 1518, the governments of several states commanded all their cities to withdraw from the connexion. The union then withdrew from several others, and confined the association to the limits of Germany and its immediate vicinity. This made them no longer the objects of fear or of envy; but they thus became weakened, and eventually sunk, about 1622. The league has long ceased to exist; and the towns, once so famous, carry on their trade, each separately, independent of the rest.

20. That we might give the account of the Hanse Towns in one view, we have brought it down much below the general course of our history; and we must go

What did the confederates do? 14. What of their power? 15. How did they obtain many important privileges? 16. Were the Hanse

Towns of service in forwarding the crusades? 17. Were privileges allowed them in England? 18. What of Sir Francis Drake? 19. What of the

back a little, in the order of time, to watch the progress of commerce in another quarter.

21. Venice, Genoa, Pisa, &c. were great trading cities; and by bringing the precious commodities into Europe, obtained vast wealth by the sale of them. Some of the Lombard cities, Florence eminently, set up manufactures, and laid all Europe under contribution, by the excellency of their fabrics.

22. We find them, in 1251, establishing houses for trade in various parts of Italy, and even in several foreign nations of Europe. Many of the merchants of Florence, who had amassed great wealth, were applied to by needy princes and nobles, to whom they lent their money at considerable interest. This business they could transact with ease, by reason of their houses and establishments, in so many countries.

23. They introduced the mode of remitting money by bills of exchange, and got nearly the whole of the money business into their hands. They became thus the bankers of Europe. Milan, Vienna, and several other cities, followed their example; and as these were all cities of Lombardy, the name of *Lombard Merchants* became attached to dealers in money. The remains of this are in Lombard-street, in London, where, to this day, many bankers carry on their business.

24. Florence having purchased the port of Leghorn, we find them, in 1425, endeavoring to obtain a share of that Indian commerce, by which Venice had become wealthy. They sent ambassadors to the Sultan of Egypt, who received them graciously, and gave them leave to form settlements, build warehouses, a church, &c.

and to have a consul to manage their concerns.

25. In 1464, died Cosmo de Medicis, of Florence, who received from his grateful citizens, the honorable title of *Father of his country*. He was the first magistrate of the city, and had sustained that distinguished character for thirty-four years. He was the greatest merchant of his time, having commercial houses in every part of Europe, and accommodating all who had occasion either to remit or to borrow.

26. Yet, with a mind noble and liberal, he spent his vast wealth in conferring benefits on his country; by great works of architecture, fostering the arts, rewarding learned men, and buying up all the treasures of ancient literature which could any where be found. When Naples and Venice made war with Florence, he deprived them of the means of continuing the contest, by calling in the vast sums of money owing to him, in those countries. It was by money borrowed of him, that Edward IV. supported his wars against the house of Lancaster.

27. In about a dozen years, we find Lorenzo de Medicis, grandson of the former, sustaining similar honors, and obtaining, by the application of his vast wealth, the title of *Magnificent*.

28. Perhaps there is no period more splendid in the history of Florence, than about 1490, under Lorenzo's administration: a wise system of peace had enabled the citizens to give all their energies to trade; and they had succeeded accordingly. Through Egypt, they procured the most precious commodities of the East, to a great extent; these found a ready market in every country of Europe. Their fine linens were fabricated from the flax grown

league formed against the Hanse Towns? 21. What great trading cities then existed? 22. What did they establish in 1251? 23. What mode of remitting money did they introduce? 24. What

did they do in 1425? 25. When did Cosmo de Medicis die? 26. What of his wealth and liberal-y? 27. His grandson? 28. What is the most splendid period in the history of commerce?



in their own fields. Silkworms were plentiful, and well managed among them; the produce was wrought up into the finest silk and richest velvets. The material for their woollen manufactures was procured partly from Spain, but chiefly from English fleeces. Although the English paid dearly, when they took back their own wools woven into cloths, yet the trade was very lucrative to both parties.

29. We find too, in 1546, King Henry VIII. agreed with some Florentine merchants, to import 'for our pleasure, and our dearest wife the Queen, goldsmiths' work, tissue of gold and silver, tinsel, velvet, silk, cloths, and tapestry, fringes, and lace;' upon condition that he was to have the first sight, and the refusal.

30. At one time, and for some centuries indeed, the principal manufactories of Europe were in Flanders. The indefatigable industry of the Flemings, joined with a considerable portion of shrewd ingenuity, produced to them wealth in an eminent degree. Their chief business lay in the clothing trade; and their principal material was the English wool.

31. If we go back so far as the year 960, we shall find them trading to great advantage, chiefly with the French, who were able, by the fertility of their soil, to carry goods for barter, equally desirable with their well-labored cloths. Money was too scarce then, (in the time of Alfred,) to become the medium of commerce. Baldwin, Earl of Flanders, saw the importance of this exchange of merchandise: and, very wisely, established weekly fairs, in four of his principal cities, for this purpose. And for the encouragement of trade, he exempted from taxation all goods brought thither at those times.

32. We have reason to think, that long

before the Normans settled in England under William, the English wools were well prized in Flanders, and bought up, to supply the manufactures there. In 1198, the trade must have been considerable to the Flemings, as forty-five sacks of wool, intended for them, were seized at the port of Hull only. It was esteemed superior to Spanish wool, at that time. King John gave them the privilege of freely trading here for wool; and for ages, the finest cloths were sent from Flanders, all over Europe.

33. In 1253, we find the Flemings famous for their linens also: none so perfect, nor so fine, as theirs. The beneficial effect of these manufactures was felt by all ranks. The Earl of Flanders became exceedingly opulent, as did also many of the merchants.

34. This prosperity received a check from that curse upon all success, war.—A civil war arose, in which thirty thousand Flemings fell in one battle; and half a century elapsed before the peaceful arts could recover from this obstruction; but the native industry of the people at last triumphed, and well repaid them. They still greatly depended on England for wool; and, in 1337, Edward III. sent off six thousand sacks to Brabant: he bought them of his subjects, at 6*l*. per sack, and sold them at 20*l*. each. He depended on the sale of wool, for money to support his army in his wars with France. It was under his patronage, that wool-staplers and weavers were invited to come over and settle in England, a few years before, in 1331.

35. The Netherlands continued eminent for their manufactures, and in the commerce thence resulting, till, in 1584, the beautiful city of Antwerp was besieged

29. What do we find in 1546? 30. Where were the principal manufactories of Europe? 31. How far back did they trade with the French?

32. Were the English wools prized in Flanders? 33. For what were the Flemings famous in 1253? 34. What check did this prosperity receive?

and taken by the Duke of Parma, the Spanish Governor. For three days his soldiers plundered the city, from which they carried off immense wealth, and destroyed still more by fire: three thousand of the inhabitants fell by the sword, and as many more were burnt, trodden to death, or drowned.

36. The ruin of this city destroyed the prosperity of the country; and all its noble manufactures were dispersed among other nations. The fisheries were removed to Holland; the woollen manufacture was settled mostly at Leyden; the linen went to Haërlem and Amsterdam. One-third of the merchants, and artisans in silks, damasks, serges, and lighter woollens, stockings, &c. settled in England. Some of the refugees went to Sweden, and taught the natives to cast cannon, and work in iron, brass, and copper, extracted from their own mines; and which they had before sent to Prussia, to be forged and wrought up.

37. Thus the cruel, persecuting spirit of Popery caused the ruin of those once happy and flourishing provinces.

## CHAP. XLII.

1. Hitherto, the trade to India, whoever possessed it, was carried on through Persia by land, or by sea, through Egypt, subject to the dominations and extortions of the Saracens. It had enriched Amalfi, Venice, Genoa, Pisa, Florence, Barcelona, all cities on the Mediterranean, and had raised a spirit of jealousy in other powers, because they were unable to procure the precious commodities of the East, otherwise than at exorbitant prices, laid upon them by these monopolizers.

2. But the time was fast approaching

35. Did the Netherlands continue eminent for their manufactures? 36. Did the ruin of this city destroy the prosperity of the country?

1. How was the trade to India hitherto carried

when enterprise, animated by some scattered rays of science, was destined to discover a new way to that land of gold and diamonds. The whole trade then took a different channel, and poured its superabundant wealth upon other nations.

3. In 1415, John, king of Portugal, took Ceuta, on the coast of Africa, from the Moors; and by conversing with some of the Saracen captives, his son, Prince Henry, began to conceive the practicability of sailing round Africa, and passing over an open sea the whole way to India.

4. He was a prince whose mind was enlightened and cultivated beyond the general attainments of the age; and when he came to the throne, he spread a love of science through his small kingdom, whereby he raised it to considerable eminence and power. He encouraged learned and ingenious men, in every branch of knowledge. He erected an observatory, and endowed schools. He employed the most skilful geographers to construct maps; and although these were extremely incorrect, being composed chiefly from report, they served to show in what direction the unknown parts should be sought for. And he became very desirous of making discoveries, when he saw so plainly which way such endeavors should be directed.

5. His first voyagers crept cautiously along the coast of Africa, till they came to Cape Bojador, in lat. 27. N., a little more southerly than the Canary Islands. Their first voyages were disgraced by hostile attacks on the negroes, and the kidnapping of slaves. Yet the advantages they obtained served to sanction subsequent attempts at discovery, which otherwise had appeared wild and useless schemes. In 1481, a castle was built

on? 2. Did it take a different channel? 3. 4. What of John, king of Portugal? 5. Where did the first voyagers go? 6. Whither did he send per sons? What of Bartholomew Diaz? What name



and the king of Portugal assumed the title of 'Lord of Guinea.'

6. John II. sent persons overland to India, to gain information, by whom he was encouraged to hope, that, by perseverance, a way by sea to India would certainly be discovered. But before he received this information, Bartholomew Diaz returned from a long voyage, of above a thousand miles. He had gone to the southern extremity of Africa; but had been beaten back by the storms he met with there. John, delighted with the expectation of soon accomplishing his wishes, called the stormy point the 'Cape of Good Hope,' which name it bears to the present day. This was in 1487.

7. Ten years elapsed before any farther attempts were made. Then, in 1497, Emmanuel, king of Portugal, sent out Vasco de Gama, with three ships, to prosecute the long-desired discovery. He succeeded in passing the Cape, and steered up the eastern side of Africa: he was surprised to find numerous nations much more civilized than the negroes of the western coast. At Quiloa and Mombaza he found large ships, charts, instruments, and a direct trade to India. He procured an Indian pilot, and sailed straight across the ocean, for Calicut.

8. The way was now open to India, and thereby to wealth and luxury. All the power or machinations of Venice could not stop up this passage; nor could they, in their old tedious course, compete with this direct, easy, and expeditious mode of procuring the commodities so much desired by all the European nations.

9. In 1500, Emmanuel, encouraged by De Gama's success, sent out De Cabral, with thirteen ships, and twelve hundred

men, for India. Driven far to the west, by a storm, he came upon the South American continent, at the part now called Brazil; of this he took possession; and it has been an excellent fund of wealth to the Portuguese ever since. As De Cabral went out to make settlements, he took possession of Sofala, Mozambique, &c., on the eastern coast of Africa. Thence he sailed to Cochin and Cananore, on the Malabar coast of Hindoostan. On his return, he brought to Lisbon treasures of immense value.

10. Portugal now became the centre of commerce; and this small kingdom was, by a succession of wise princes, raised to great eminence, prosperity, and power.

11. Vasco de Gama went out again, in 1501. He then built a fort at Cochin, subdued some petty kings on the coast of Africa, and sent ships against the Moors, about the mouth of the Red Sea. These were the greatest enemies of the Portuguese in India; being stimulated by the Venetians, who hoped to crush the Portuguese commerce in its infancy.

12. This commerce, however, flourished splendidly, till the kingdom was seized, in 1580, by Philip II., king of Spain. Spain was not enriched by this conquest; because nothing can enrich the indolent. But Portugal sank under her oppression; till she revived again, on the House of Braganza obtaining the throne, in 1640.

13. Thus we have seen the Portuguese pressing on southwards, till they doubled or turned round the Cape of Good Hope; and then they found a ready way to India. In so doing, they only persevered in a track which was strongly supposed, nay almost known, to be practicable. But we are about to contemplate exertions made

was given to the stormy point? 7. How many years elapsed before any farther discoveries were made? What was then done? 8. Was the way now open to India? 9. In 1500, what was done?

10. Did Portugal increase in power? 11. Did Vasco de Gama make another voyage? 12. How long did this commerce flourish? 13. Did Portugal revive again? 14. What of Columbus?

in another direction, concerning which experience said nothing, and science only ventured to guess and to hope.

14. Christopher Colon, or, as he is usually called, Columbus, conceived the strange project of searching out a way to India by sailing directly west; although going, apparently, quite away from the object sought after. That the earth was a large plain, had been the ignorant notion of many philosophers; but he had imbibed the opinion of its being a globe. As the account of India represented it as stretching to an unknown extent eastwards, he supposed that its eastern extremity might be sooner found by sailing directly westward.

15. His project was treated as a wild chimera; and he had to endure rebuffs and contumely for several years: but with the perseverance which accompanies a great mind, he continued his applications to different states for patronage, till at last, Isabella, queen of Castile, and consort of Ferdinand, king of Arragon, furnished him with three small vessels, for the fitting out of which she was obliged to pledge her jewels. With astonishing hardihood, Columbus sailed through those unknown deeps, and at last received the reward of genius in the discovery, not indeed of India, but of large and well-peopled countries.

16. In subsequent voyages, he discovered the main continent of America; future navigators quickly followed his course, till the double continent of the Western hemisphere was completely explored, and a new world was opened to Europe. Americus Vespucius, a native of Florence, sailed in his track, and, by a singular injustice, succeeded in giving his name to the newly-discovered land. New scenes of barbarism

and of civilisation rose in view, with new opportunities for commerce.

17. Spain found gold in plenty there, but was not enriched; for the wealth so obtained, made her people idle; and it is not gold, but science and industry which make a nation wealthy. It was in 1492, that Columbus discovered this Western world; and, still imagining that India stretched thus far, he gave to his discoveries the name of *West Indies*, which still adheres to those fruitful islands.

18. The whole stream of commerce was now diverted, or rather split, into two directions, east and west; and the old channels of trade became almost dried up. We will now glance a moment to the progress of commerce in Great Britain.

19. The trading to England of the Phœnicians for tin, in ages far remote, is well authenticated. It is known, too, that in the time of the Romans, there was continual intercourse with Rome and its dependent provinces; yet neither of these could well be called the trade of Britain. When the Romans left the island, wars and devastations succeeded for ages; and we must come down to the time of Alfred, before we can discern any thing like trade.

20. He built a great navy, well aware that no effectual resistance could be made against the Danes, but by meeting them at sea, and not suffering them to land. He built also ships for trade; and as he had jewels, silk, &c. there must have been some commerce. Indeed, he is said to have sent the Bishop of Shirebourn with relief to the Christians in India, and endeavored to settle some regular intercourse with those distant parts.

21. Athelstan, in 938, in order to en-

15. How was his project received? Who furnished him with vessels? 16. Did other navigators follow? Who succeeded in giving his name to the new world? 17. Was Spain enrich-

ed by the gold she obtained? 18. Was commerce now diverted? 19. What people traded to England for tin? 20. What did Alfred do? 21. Athelstan? 22. What of the dominion of



courage commerce, conferred by law the high rank of Thane, or Lord, upon any merchant who had made three voyages over the sea with his own vessel and cargo. That there was some commerce in horses, appears by his making a law against their exportation, except as presents.

22. The dominion of the Danes in England had one good effect, as then all the Northern nations being under one head, trade was free, and there were no pirates.

23. The manufactures of those times were but few; yet the English goldsmiths were famous for their jewellery work, foreigners coming over to procure them; and the females were celebrated for their rich and exquisite embroideries, even so early as the time of Alfred. The green pastures of England had always supported innumerable flocks and herds, and there is reason to suppose that the wool was, even then, bought up by the Flemings, as we well know it was afterwards.

24. From the period of the Normans settling in England, the whole aspect of the times and manners, as well as of the history of them, is changed. The conqueror's gleanings from the oppressed country, after all his wars, amounted to sixty thousand pounds weight of silver; besides gold, gems, and brilliant jewels. Internal trade must have been insecure, as a law was made forbidding markets to be held, except in cities, and borough towns, where they could be protected. The importance of such places appears in another law, that if any slave escaped from his lord, and lived one year in a city or borough town, he should continue free for ever: this was an excellent means of refuge against oppression, and tended to raise the towns, and increase the number of freemen.

25. In 1156, when Henry II. reigned, most of the houses in London were thatched; yet bishops, and nobles, and some of the richer citizens, had houses of stone. A writer of that date tells us, the citizens were eminent for the elegance of their dress and manners. He says, no city in the world exported merchandise to such great distances. He mentions goods of Egypt, Bagdad, and India, as imported; but whether direct from those places, or from Venice, or Genoa, he does not say.

26. A market was held every Friday, in Smithfield, for horses and cattle. The King's palace at Westminster was two miles from the city; and all the space between was occupied with houses and gardens, belonging to the citizens. On the north were open fields, and a lake, (now Moorfields,) and beyond these a forest wherein the citizens diverted themselves with hunting.

27. The commerce at this time was chiefly in the hands of foreigners, who brought their choice commodities to a good market. Bristol, Chester, and Norwich, were famous for commerce; ships coming to them from Ireland, Aquitaine, Norway, and Germany.

28. The long reign of Henry II. seems to have been favorable to English industry and commerce. He ordained that no ship built in England should be sold to foreigners. The produce of the mines of copper, iron, lead, and tin, was exported. The English had no mines of silver; but they obtained that metal from Germany, in exchange for fish, wool, cattle, butter, and cheese. The author says, too, that all the nations of the world were kept warm by English wool, made into clothing by the Flemings.

29. The tumultuous reign of John be-

the Danes in England? 23. What were the manufactures of those times? 24. When was the aspect of things changed? 25. In 1156, what

was the state of society? 26. What of the Smithfield market? 27. In whose hands principally was commerce at the time? 28. Was the reign

came favorable to English liberty, as it obliged the Barons to force Magna Charta from him, and as his disputes with them obliged him in his turn to court and favor the towns, whereby trade received considerable benefit. Yet, in 1236, Henry III. and his nobles possessed the utmost contempt for citizens and merchants; and the King oppressed those of London, by grievous extortions.

30. At the coronation of Edward I. in 1274, a gorgeous display was made of silks and gold stuffs. These came from abroad; and we may see, by the quantity, there must have been some considerable commerce of exports, by which to obtain them.

31. It belongs to this history to state, that the Jews, who followed commerce wherever it went, were every where dreadfully oppressed, robbed, and murdered. Some of the English kings have been infamously eminent in these unjust proceedings. Such oppression had its usual effect, in making the objects of it cunning, servile, and extortionate in their own defence, and to avenge the injuries they sustained. Edward I. imprisoned them all over England: in one day he hanged two hundred and eighty in London, besides great numbers in other places, and confiscated all their wealth.

32. A circumstance, which appears strange to us, was very frequent during these unsettled times. Some one or more cities, of one nation, would be at war with some of the cities of another nation; although the chiefs, or kings, were mutually at peace. In 1317, the quarrels between the English and Flemings became so fierce, that all commercial intercourse was suspended.

33. The Earl of Flanders, and the King

of England were obliged to interfere, and negotiate a peace between their respective subjects. On account of these disturbances, merchants never knew, when they set out upon a voyage, whether they should be treated as friends, or have their property seized, as enemies, and be themselves imprisoned, when they reached their destined port.

34. It was in 1331, under the invitation of Edward III., that John Kempe, a weaver of woollen cloth, was encouraged to come over to England, with his servants, apprentices, and all his goods. Edward had observed the wealth accumulated by the manufacturers of English wool in Flanders; and wishing to keep that money in England, he endeavored to obtain weavers, who might teach the English this important art, and thus prevent so much treasure from going out of the kingdom.

35. The wisdom of his policy is felt at the present day; the woollen manufacture being one of the most important branches of their trade. The reign of Edward was long; and, in spite of wars and difficulties, the English applied themselves to commerce with great perseverance and success.

36. The profusion of young Richard II. brought into the country all sorts of fineries, to supply the costly magnificence of his taste. But his dethronement by Henry IV. occasioned incessant wars between the houses of York and Lancaster; so that the kingdom was depopulated, and commerce and manufactures were almost ruined.

37. During this reign, however, before those wars began, the commerce of England had arisen so much, as to rouse the jealousy of the Hanse Confederacy; and, according to the fashion of those times,

of Henry II. favorable to English commerce? 29. The reign of John? 30. What display was made at the coronation of Edward I.? 31. Were the Jews oppressed in England? 32. What of

the quarrels between the English and Flemings? 33. What were the consequences of these disturbances? 34. What of John Kempe? 35. Was the policy of Edward a wise one? 36. What



this resentment broke out into piracy ; the Genoese Government seizing rich vessels of the English and openly selling their cargoes, in hopes of crushing the merchants entirely.

38. For a long season, the commerce of England was in the hands of foreigners, who brought their commodities, and took back hers. But we find the English beginning to trade on their own account, as early as the time of Henry VI. to Portugal, and, under Henry VII., into the Levant. It was in the latter reign, that Columbus made his discovery of America.

39. During his long negotiation with Spain, for the means of carrying his project into effect, and when he despaired of success, he sent his brother Bartholomew to England, to make an offer of his services to Henry VII. On his way, he was taken by pirates, robbed, and imprisoned for years : so that, before he could make his proposals here, his brother had succeeded with Spain.

40. Henry, vexed at having lost the golden opportunity, commissioned Sebastian Cabot, a native of Bristol, to make a voyage of discovery ; he reached the continent, now called North America, and traced its whole line of coast from Labrador to Florida, and even sailed to Cuba. On his return, Henry was at war with Scotland, and had neither time nor money to make a right use of such an opportunity.

41. During his reign, and by his policy, however, commerce reaped great advantages from the leave he gave to the landholders to sell their estates ; and from the restraint he put upon the nobility, against attaching to themselves great numbers of retainers. Both laws enfeebled the nobles ; and, by making the commons of much

greater importance than they before possessed, raised the reputation of trade.

### CHAP. XLIII.

1. In the time of Henry VIII., the reformation from popery took place ; which was of great service to commerce, as it stopped that absorption of activity, which occurred by every monkish institution, which shut up great numbers of men in idleness ; and that loss of money, which had been drained every year, by the Pope and clerical men, out of every nation, where the influence of Rome had penetrated.

2. In the reign of Edward VI., a northern voyager discovered Archangel, and negotiated a trade with Russia. We find also, during his reign, and long after, the famous Sir Thomas Gresham, one of the greatest merchants at that time in Europe.

3. Queen Elizabeth gave continual encouragement to commerce ; and her attention to her navy gave animation to all maritime concerns. The spirit of bravery and of enterprise prevailing at this time, exalted the national character.

4. It was in her time, too, that the cruel persecutions of the protestants in the Netherlands, under the Duke of Alva, took place. The expectation of his arrival in that country occasioned so much terror, that one hundred thousand persons emigrated with all their property ; and manufactures, which had for ages been the source of immense wealth to the Flemings, were dispersed on every hand.

5. England had its full share, as Elizabeth gave the poor refugees shelter and encouragement, whenever they came over. Canterbury, Norwich, Colchester, and many other places, became well furnished with weavers of woollens, linens, and silks ; as

were the consequences of the profusion of Richard II. ? 37. Was the prosperity of England assailed ? 38. When did the English begin to trade on their own account ? 39. What of Bartholo-

mew Columbus ? 40. Sebastian Cabot ? 41. Did commerce flourish during the reign of Henry ?

1. What event took place in the reign of Henry VIII. ? 2. Of Edward VI. ? 3. Did Queen Eliz-

also with dyers, dressers, and throwsters, whose ingenuity enriched the country, and continues so to do, even at the present day.

6. Under Elizabeth were formed several trading companies; who, by a consolidation of interests and property, were able to make greater ventures, and sustain greater losses, without ruin, than any individual merchant was capable of. The frequent piracies, which could not be repressed, made such associations necessary; and they may be regarded as the nurseries of all the great commercial transactions.

7. Companies, with exclusive privileges, are now looked upon with a jealous eye, and are considered as injurious. That free trade which tries its own resources, finds its own channel, and pushes its exertions wherever it is found to be most profitable, is beginning now to be regarded as the wisest policy in all cases; but in the infancy of commerce, this mode was not safe.

8. A company trading to Russia had all Elizabeth's influence; it struggled with many difficulties, but, in some shape, continues still. Another company associated for trading to Turkey and the Levant. This commerce became very considerable; and still is the source of much wealth, both by its exports and imports.

9. Even the East-India Company, now so vast in its possessions, so strong in its domination, and so important in its commerce, had its beginnings, though feeble, in her reign.

10. It was under her patronage, also, that settlements were first made in North America. Sir Walter Raleigh obtained a charter for planting what he called Virginia, in 1584. Sebastian Cabot had discovered the whole coast in 1496, but no at-

tempt had yet been made to send a colony thither, or to establish a trade.

11. In the reign of Elizabeth, the spirit of enterprise was pushing in every direction, and this way was fair and open, especially as settlers went on the principle of purchasing the ground of the former inhabitants. Several expeditions failed; James Town was built, and the colony began to settle; but it perished, or returned; and it was not till about 1610, in the reign of James I. that, under Lord Delaware, something like stability was effected. In 1609, Henry Hudson discovered Long Island, with the continent adjacent; and in 1614, the Dutch effected a settlement there.

12. In 1617, Mr. Robinson and his congregation, who fled from persecution in their native country, landed, and established themselves in what was then a dreary wilderness, and thus began the settlement which ultimately became the New England States.

13. It was not till 1682, that William Penn obtained the grant of Pennsylvania,



which he also purchased of the Indians. There he founded an asylum for his persecuted brethren, the Quakers; built the city of Philadelphia, and established the whole as a wise legislator.

Elizabeth encourage commerce? 4. What persecution took place in her time? 5. Did many of the refugees come to England? 6. What companies were formed under Elizabeth? 7. How are com-

panies with exclusive privileges now looked upon? 8. What of a company trading to Russia? To Turkey and the Levant? 9. The East-India Company? 10. What of the settlements in



14. These settlements soon became new channels for commerce, new outlets for the manufactures of England; while Spain, by her conquests in the West Indies, Mexico, Peru, &c., to the South, obtained the gold and the silver, which were of no use till they were spent in the purchase of manufactures. She was too indolent to labor when thus enriched, and the more industrious nations became the ultimate gainers, as she gave them her gold in exchange for articles of necessity, of use, or of splendor. The northern parts which possessed no precious metals fell into the hands of the English; but they had a fertile soil, noble rivers, dense tracts of wood, and broad savannas; all which afforded a wide scope for industry, that truest of riches, not debasing, but ennobling, those who are most laborious.

15. As about the time of Elizabeth, the Dutch provinces rose into a commercial commonwealth, and became rich and powerful, we may as well turn aside awhile, to contemplate an interesting series of events.

16. We will go back a little in point of time, and trace the rise of this Republic. We need not ascend farther than the year 1205, when a small village was built on a marshy piece of ground, near a dam on the river Amstel, which obtained the name of *Amsteldam*, and was known afterwards, as a most important and flourishing port of commerce, under the present designation of *Amsterdam*. The Earl of Holland favored the inhabitants, and endeavored to promote the trade of his province.

17. Coasted by the sea, the people naturally addicted themselves to fishing; and we find them, in 1317, supplying the London market with fish. In 1407, the Fle-

tings endeavored to confine the weaving of cloth to the cities. The inhabitants of the open villages therefore, removed and took refuge, some in England, but many more in Holland, which was much nearer; this, moreover, laid the foundation for the subsequent prosperity of the Dutch provinces.

18. The herring fishery has always been a favorite employment with the Dutch. In it they first began to use large vessels, called *busses*, in 1416; and in 1547, we find them fitting out ships of war, for its protection. This was in the time of Edward VI. of England.

19. In 1579, the people of Holland, with six neighboring provinces, being harassed grievously by the Spanish government, and especially by the religious persecutions of the furious Duke of Alva, determined, under the guidance of the Prince of Orange, to throw off the allegiance to their tyrannical masters, and to associate for their mutual defence. Thus arose the powerful state, denominated the *Seven United Provinces*. A grand principle with them was to maintain liberty of conscience, as well as all their civil rights. They began this league under the heavy pressure of a cruel war, during which they were many times reduced to the brink of ruin; yet, by perseverance, they conquered; and by addressing themselves industriously to commerce, they not only supported their expenses, but became rich and powerful beyond example.

20. During thirty years, their war in Spain continued; and as they fought obstinately on the ocean, they brought the Spanish Monarch into considerable difficulties; almost ruining his trade with the East Indies, and capturing his rich galleons,

America? 11. By whom was Long Island discovered? When did the Dutch settle there? 12. What happened in 1617? 13. When did Penn obtain the grant of Pennsylvania? 14.

What did these settlements soon become? 16. What of the rise of the Dutch provinces? 17. To what did the people addict themselves? 18. What of the herring fishery? 19. What did the people

which were bringing his golden treasures from the West. A truce was negotiated in 1609.

21. It was in 1584, as has been stated, that the beautiful city of Antwerp was taken and pillaged by the tyrannizing Spaniards, under the Duke of Parma. This impolitic vengeance ruined the commerce of the Netherlands, and raised that of neighboring countries, especially of Holland. To Haerlem, and to Amsterdam, the inhabitants fled, the linen weavers especially, in vast numbers; whereby they increased the industry, wealth, and power of that trading republic.

22. In 1595, the Hollanders began to send ships round the Cape of Good Hope, to India; where, as the Portuguese were growing feeble, the Dutch found it easy to dispossess them. The year after, we find them taking Amboyna, and entirely subduing both the Spanish and Portuguese settlements, in the Moluccas, or Spice Islands. They also formed settlements at Balsora, on the Tigris; on the coasts of India, Cochin, &c., and on the islands, even to Japan; making Batavia, in the island of Java, their grand emporium, and the seat of their Asiatic Government.

23. The prosperity of the United Provinces grew with great rapidity; following every commercial nation into every sea, and to every city, where trade could be carried on. Portugal was subject to Spain till 1640. The continual wars of the Dutch with Spain gave them opportunities of attacking their eastern possessions; the decay of Spain, from the expulsion of the Moors, and the exportation of her natives to America, rendered the contest unequal. The Dutch obtained firm footing in India, and

at the peace, in 1647, all they had thus gained was confirmed to them.

24. Their trade seems to have been at its height about the year 1560. Other nations have, by strenuous exertions, obtained considerable shares with them, since that period; yet the Dutch have usually had a very great commerce, which enabled them to resist the encroachments of France, under Louis XIV.; although they were at one time so near ruin, as to contemplate the removal of the whole nation to Batavia. In despair, they cut their dykes, and drowned their country, to drive the enemy away; and, by great exertions, both by sea and land, they maintained their independence.

25. In our own days, we see, that, in consequence of the French revolution, and the wars arising out of it, several of the principal foreign stations of the Dutch have fallen into the hands of the English; and their dissensions at home have paralyzed their exertions; so as to reduce their domestic industry and their foreign commerce to a much smaller compass than it had half a century ago. Antwerp has been occupied by foreign troops, and the Dutch king has been forced to submit to the United forces of France and England.

26. We have given a detail of the commerce of England till the time of Elizabeth; when activity on the wide seas became fashionable for all ranks.

27. We have hinted at the beginning of the East-India Company; Elizabeth gave it the first charter, in 1600. The Company did not form a common stock, but each merchant traded separately. The consequence was, that they conducted their affairs but feebly, and made no settlements, till, in 1620, they built a fort at Madras.

of Holland do in 1579? 20. How long did their war in Spain continue? 21. When and by whom was Antwerp taken? 22. When did the Hollanders begin to send ships round the Cape of Good

Hope? 23. Did the prosperity of the United Provinces increase? 24. When was their trade at its height? What did they once do to drive away the enemy? 25. What have we seen in



In 1622, we find them driven from Amboyna, in a murderous manner, by the Dutch, who were determined to have the whole of the spice trade to themselves.

28. In the West Indies, sugar is the staple commodity. Hitherto, England and Europe had been supplied from Brazil, by the Portuguese; but now, Barbadoes, the first of the British sugar colonies, began to send some to England.

29. The East-India Company was dissolved in 1655; but the injury to commerce was so great, that it was re-established two years afterwards. In 1655, under the government of Oliver Cromwell, the island of Jamaica was taken from the Spaniards; and as Cromwell wanted to have Hispaniola and Cuba, he treated this conquest with scorn; yet it has proved of immense advantage to England. Spain was fast decaying in power, which it had used haughtily; and, by that means, had forced other nations to make great exertions, in order to contest with her. Holland had risen with astonishing rapidity; and her people had become the common carriers of Europe.

30. England had also entered with great spirit into commerce; and the Navigation Act, made during the commonwealth, had great influence in forcing up her resources; as it forbade the bringing any foreign commodities hither in any but English vessels, unless they were the produce of the people who brought them. This act half ruined the trade of the Dutch, as they could no longer be carriers for England.

31. In 1685, England, Holland, and all the Protestant states of Europe, received a great accession of inhabitants, wealth, manufacturing skill, and commercial ener-

gy, by the folly and bigotry of Louis XIV., who revoked the edict of Nantes, by which the Protestants of France had held the privileges of their religion and worship. In a cruel manner was his will executed: he sent dragoons into all the Protestant towns and villages; and they committed every sort of outrage and insult upon the unoffending and most honorable merchants, artisans, and manufacturers of his kingdom. It is said, that nearly a million of his best subjects, men, women, and children, with immense riches, were thus lost to France, without any gain or compensation, except the gratification of a superstitious and depraved priesthood.

32. The English East-India Company were at this period forming settlements, and increasing their trade. In 1689, we find them settled on the river Hooghly, and founding Calcutta, now the principal of their three presidencies in Hindoostan; the others are, Madras, on the eastern coast, and Bombay, on the western.

33. By the accession to the British throne of the Royal Family of Brunswick, the stability of the government becoming every year more apparent, commerce increased with great rapidity. Many places, which had been but villages, sprang up, and became rich, and important as well for size as for mercantile dealings. Liverpool, Manchester, &c. are instances of this prosperity.

34. Commerce, during the last century, has spread so widely, and ramified itself into so many branches, that to trace them minutely, or even to name them all, would overload the memory, and defeat the purpose of this sketch. It may be worth while, however, to say something concern-

our own day? 27. What of the East India Company? What happened to them in 1622? 28. Whence did England begin to obtain her sugar? 29. When was the East-India Company dissolved and re-established? 30. When and under whose

government was the island of Jamaica taken from the Spaniards? 31. What of the Protestant persecution in France? 32. The English East-India Company at this period? 33. The accession of the family of Brunswick to the throne? 34

ing the East-India trade ; because its prosperity has been great, and its importance to the nation is prominent.

35. The English had traded with considerable success, notwithstanding much opposition from the Dutch and the Portuguese. They formed a settlement at Surat, which languished till an unexpected circumstance brought them into favor. An English physician had restored a daughter of the Great Mogul to health ; and, as a reward, he received permission for a free trade. A similar kind of success with the Nabob of Bengal, enlarged this privilege in that quarter. The ebbs and flowings of this stream of commerce were greatly influenced by struggles at home, between two rival companies ; which were at last united into one, in 1708 ; and this union continues to the present day.

36. But a principal occasion of this great accession of territory and power, appears in a contention for the Mogul throne. A second son succeeded to the royalty, and the French took part with him ; while the English espoused the cause of the elder son, as rightful heir. In the wars which took place during this quarrel, we find Mr. Clive, afterwards Lord Clive, gaining great renown. By secrecy and expedition, he obtained possession of the enemy's city, before his coming was known ; and, soon after, he defeated him and his French allies, in an open battle, in 1752.

37. In 1756, the Nabob of Bengal took Calcutta, and brutally confined a hundred and forty-six prisoners in so small a dungeon, that only twenty-two were found alive in the morning, the others being suffocated. Clive repeatedly defeated him, with only a handful of troops, especially at Plassey, in 1757. The consequence

was, the reduction of a considerable part of the province of Bengal, and an accession of reputation and influence to the Company, all over Hindoostan.

38. A new enemy soon arose, who endeavored to extirpate the Company ; this was Hyder Ally, assisted by French officers. In 1780, he fell unexpectedly on their possessions, with an army one hundred thousand strong, and gained several advantages ; but he was defeated next year, by Sir Eyre Coote. Tippoo Saib, the son of Hyder Ally, strengthened himself, and endeavored to carry on the contest ; but Lord Cornwallis penetrated into the heart of his dominions, invested and took his capital, Seringapatam, and Tippoo himself was slain in its defence.

39. The Company have not only great mercantile transactions, but they also possess actual territory as large as half Europe. Their trade also is great with the Spice Islands ; and with China especially, for tea, which is become a necessary of life for almost every individual in England, as well as the United States.

40. I come now to a mention of the progress of commerce in our own country. Scarcely were we freed from our allegiance to Great Britain, than our commercial enterprise and resources began to develope themselves. Our ships began to penetrate to the most distant seas, and to bring home with them the produce of every clime. It soon became a common thing for an American merchantman to make a voyage round the world, starting from some port in the United States, going round Cape Horn to the north-west coast of America, taking in furs, sailing to China, and going thence with tea, &c. to the ports of Europe.

41. Various causes have contributed to

What of commerce during the last century ? 35. How was the trade of the English assisted ? 36. What of the contention for the Mogul throne ? Lord Clive ? 37. What did the Nabob

of Bengal do in 1756 ? Was he defeated by Clive ? What was the consequence ? What of Hyder Ally ? Tippoo Saib ? Was he slain ? 39. What is the state of the Company ? 40. What of com



direct the attention of a large portion of our population to commercial pursuits. With a sea-coast two thousand miles in extent, and indented with many fine harbors, it was natural that many of the inhabitants should betake themselves to the sea for a subsistence. Excellent timber for ship-building being likewise abundant, seemed to hold out another temptation to a great portion of the people.

42. Near the shores of the northern states, and on the adjacent banks of Newfoundland, are fishing stations, unsurpassed by any in the world. Fishing is consequently a lucrative employment, in proportion to the capital invested, and constitutes the occupation of many of the inhabitants of those states. The fishermen having

become accustomed to a seafaring life, and acquired the requisite skill and knowledge, soon pass into larger vessels, destined for more distant and perilous voyages.

43. The state of the world, for several years subsequent to the commencement of the French revolution, offered great encouragement to the commercial enterprise of the country. While almost every other power was engaged in war, the United States were neutral; their vessels navigated the ocean in safety, and were employed to carry, from port to port, the commodities of those nations which were at war. Our commercial prosperity is now established on an enduring basis. The blow that destroys it, can be given alone by our own hands.

merce in our own country? 41. What causes have contributed to direct the attention of our population to commercial pursuits? 42. What

of our fishing stations? 43. Our commercial prosperity?

# CHRONOLOGICAL TABLE.

- ADMIRALTY**, courts of, erected in England, 1337, incorporated 1768.
- Africa**, one of the great land sections of the earth, the ancient *Lybia*, received its modern name from that of a small province on its northern coast, of which *Carthage* was the capital. Area about eleven millions of square miles; and in proportion to extent and geographic position, the least habitable part of the earth.
- Air Balloons**, invented by *Gusmac*, a Jesuit, in 1729, and revived in France, by *Montgolfier*, 1782, and first sent up at Paris, August 27th; introduced into England by *Mr. Lunardi*, who ascended from *Moorfields*, September 15th, 1784. *Mr. Blanchard* and *Mr. Jefferies* went from *Dover* to *Calais* in about two hours, January 7th, 1785. Since the first ascension in France, *Garnerin*, *Blanchard*, and others, have made familiar the phenomena of this once astonishing performance.
- Air Guns**, invented 1646.
- Air Pumps**, invented by *Otto Gnrick*, in 1654.
- Albany**, city of the United States, and seat of government of *N. York*; founded by the Dutch about 1612.
- Alexandria**, city of the United States, in the District of Columbia; taken by the British on the 30th of August, and evacuated by them on the 6th of September, 1814.
- Algebra**, or the Arithmetic of Symbols, invented, it is supposed, in India, was introduced into Europe about A. D. 1300, by the Saracens of Spain. Had gained extensive use in 1500.
- Alliance**, Holy, a treaty called the Holy League, formed at Paris, September 26th, 1815, between Alexander, emperor of Russia, Francis I. emperor of Austria, and Frederick William III. king of Prussia, as the contracting parties avowed, "for the protection of religion, peace, and justice, &c." In 1817, the kings of Denmark, Sweden and Norway, the Netherlands, and the Swiss Cantons, acceded to this compact.
- Alum**, first discovered at *Rocha* in Syria, A. D. 1300; in Tuscany, 1460; first made to perfection in England, 1608, discovered in Ireland, October 22d, 1757; in Anglesia, 1790.
- America**, or as called relatively to the Atlantic Ocean, and to the western coasts of Africa and Europe, "Western Continent," was supposed to have been first discovered from Europe, by the Normans who reached some of the shores of Labrador or Newfoundland, about A. D. 1000. Those early discoveries were, however, forgotten, and left the glory undiminished, to Columbus, who reached the West Indian Archipelago, in consequence of a persevering determination to solve a problem, previously and profoundly laid down. This event took place October 11, 1492.
- Annapolis**, city of, capital of Maryland, founded 1692; made the seat of the General Assembly of Maryland, 1699.
- Antwerp**, city of, or as the French write the name, *Anvers*, first noticed in history, A. D. 517. This city affords a most remarkable instance of the vicissitudes of commerce. In the middle ages, Antwerp became the great emporium of the trade and manufactures of the Netherlands, and as late as 1568, was supposed to contain 200,000 inhabitants, but as manufactures became encouraged in Great Britain, the consequence of Antwerp declined, and it does not contain at present above 60,000 people.
- Archangel**, in Russia, the most important seaport in the world in so high latitude. The English first reached it round the North Cape of Europe in 1553. It was then the only port of Russia.
- Arithmetic**, by the Arabian figures, introduced into Europe by the Saracens of Spain, in the ninth and tenth centuries of the christian era.
- Baffin's Bay**, separating Greenland from North America, discovered by captain *Baffin*, in 1622.
- Bahama**, islands of, discovered, 1629; taken possession of by the British, 1718; much injured by a storm, October, 1796; and again, July 22d, 1801.
- Baize** manufacture first introduced into England, at Colchester, 1660.
- Baltimore**, city of the United States, in Maryland, on a small bay of *Patapsco* river, founded 1729, is extremely well situated for commercial connexions with the valley of Ohio; it commands the trade of Maryland; more than one half of that of Pennsylvania, and a part of New York.
- Bark**, Jesuit, virtue of discovered 1500; brought to Europe 1650.
- Barometers** invented 1626; wheel barometers contrived, 1668; phosphoric, 1675; pendant, 1695; marine, 1700.
- Bermuda Isles**, discovered 1527; settled 1612; most destructive hurricane swept over, July 26th, 1813.
- Blankets** first made in England 1340.
- Bombs**, first invented at *Venloo*, and used in the siege of *Wachtendonck*, 1588; first used in the service of France, 1634.
- Bomb-vessels**, first invented in France, 1681.
- Bombay**, taken from the Portuguese by the English, 1661; nearly destroyed by fire, and many lives lost, February 27th, 1803.
- Books**, in the present form, were invented by *Attalus*, king of *Pergamus*, 887; the first supposed to be written in *Job's* time; 30,000 burnt by order of *Leo*, 761; a very large estate given for one on *Cosmography*, by king *Alfred*; were sold from 10l. to 30l. a piece, about 1400; the first printed one was the *Vulgate* edition of the Bible, 1462; the second was *Cicero de Officiis*, 1466; *Cornelius Nepos* published at Moscow, being the first classical book printed in Russia, April 29th, 1762; books to the number of 200,000, burnt at Constantinople, by the order of *Leo* I., 476; above 4,194,412 volumes were in the suppressed monasteries of France, in 1790, 2,000,000 were on Theology, the manuscripts were



- 26,000; in the city of Paris alone were 808,120 volumes.
- Boston**, in Massachusetts, founded 1630; port of, shut by order of the British government, the first act of violence which led to the subsequent revolution, 1774; besieged by the Americans 1775; evacuated by the British army March 17th, 1776.
- Botany-bay**, on the eastern coast of New Holland. Here the first vessel laden with colonists from Great Britain arrived 20th January, 1788, and made the depot of convicts from that country.
- Brazil**, eastern and central part of South America, discovered by Cabral, 24th April, 1500; 1504, first civilized settlement on, made by Amerigo Vespucci.
- Bread**, made from the flower of gramineous fruits, discovered in very early ages, but not made with yeast by the English, until 1650.
- Bread**, fruit, first introduced into the West-Indies, by Capt. Bligh, January, 1793.
- Buckles** were invented about 1680.
- Cables**, a method of making them invented, by which 20 men are enabled to do the work of 200. The machine is set in motion by sixteen horses, for the cable is of the dimensions of the largest ships, 1792.
- Calcutta**, city of Indostan, on the Hoogly, outlet of the Ganges, formerly an insignificant place, was taken by the English, 1689; besieged in it 1757, and taken; when 146 persons were enclosed in a prison, called "The Black Hole," of whom 123 perished in a few hours. It is now the first city in Asia, containing at least 80,000 houses, and 500,000 inhabitants, composed of Europeans, Hindoos, Chinese, &c.
- Calico**, first imported into England, 1631; first made in Lancashire, 1772; calico-printing and the Dutch loom, first used in England, 1676.
- California**, discovered by Cortes, 1543; explored more extensively, 1684; coast of, explored by la Perouse, 1786.
- Canada**, discovered by Cabot, 1499; explored by the French, 1508, 1594, and 1534; settled, 1540; Quebec built, 1603; taken first by England, 1628, but restored to France by the treaty of St. Germain; invaded and conquered by Great Britain, in 1759; formally ceded by France, 1763. This country has been twice unsuccessfully invaded from the United States since the revolution of 1775.
- Canals**.—The first regular chain of artificial water inter-communication, of which history has transmitted to us the record, was that between the Nile and the Red Sea. This canal route was examined with great care by the French engineers, and several portions found in 1798, in such a state of preservation as only to demand cleansing.
- Canals in the United States** commenced in Massachusetts. The company formed to construct, what is now called the Middlesex canal, was incorporated 1709; commenced the work, 1790, length, 29 3-4 miles, and entire fall, 107, by locks; 24 feet wide, with four feet water.
- The greatest**, however, of all works of this nature, yet executed in America, are the two great canals of New York. The western canal from the Hudson river to Lake Erie, was first suggested by Mr. Gouverneur Morris, about 1803; surveys were directed by a resolution of the legislature of New York, in furtherance of this project, 1808; first board of commissioners organised, 1810, consisting of Gouverneur Morris, Stephen Van Rensselaer, De Witt Clinton, Simeon De Witt, William North, Thomas Eddy, and Peter B. Porter. Law authorising the actual survey of the ground, passed April 17th, 1816: this great work was commenced, July 4th, 1817, completed, and the water of Lake Erie let into it, October 26th, 1825, employing 8 years and 141 days. The completion of the Northern, or Lake Champlain Canal, preceded that of Erie, and both taken together consummate the inland communication between the Great Bay of Hudson, and the Basin of St. Lawrence.
- Canary Isles** discovered, 1344; explored 1393.
- Candles**, of tallow, so great a luxury in England, that splinters of wood were used for light, A. D. 1300—no idea of wax candles until long afterwards.
- Candle-light** introduced into churches on the continent of Europe, 274.
- Cape de Verd Islands** discovered, 1447.
- Cape of Good Hope** discovered, 1487; planted by Holland, 1651; taken by the British, 1795; again January 8th, 1806, and definitely ceded to Great Britain, 1814.
- Cape Horn** first sailed round, 1616: Straits discovered, 1643.
- Carriages** first introduced into Vienna, 1515; into London, 1580.
- Charlestown**, (Massachusetts) burnt by the British, June 17, 1775.
- Charleston**, South Carolina, surrendered to the British forces, May 4, 1780.
- Charleston**, South Carolina, founded and made the seat of government of Carolina, 1680.
- Cherries** brought to Rome, by Lucullus, 70; apricots were first introduced into England, from Epirus; peaches from Persia; the finest plums from Damascus and Armenia; pears and figs from Greece and Egypt; citrons from Media; pomegranates from Carthage, about 114 years before Christ.
- Chimnies** first introduced into buildings in England, 1200; only in the kitchen, or large hall, smoky; where the family sat round a large stove, the funnel of which passed through the ceiling, 1300.
- China**, made in England, at Chelsea, in 1752; and in several parts of England, in 1760; by Mr. Wedgwood, 1762; at Dresden, in Saxony, 1706.
- China**, first voyage to, from the United States, 1784; China porcelain first spoken of in history, 1591.
- Chocolate**, introduced into Europe, from Mexico, 1520.
- Cinnamon** trade first began by the Dutch, 1506; but had been known in the time of Augustus Cæsar, and long before.
- Circumnavigators**—The first was Magellan, or rather

- by his fleet, as he was himself slain on the voyage, 1520; Groatva, 1527; Alvaradr, 1537; Mendana, 1567; Sir Francis Drake, 1577; Cavendish, 1586; Lemaire, 1615; Quiros, 1625; Tasman, 1642; Cowley, 1683; Dampier, 1689; Cooke, 1708; Clipperton and Sherlock, 1719; Anson, 1740; Byron, 1764; Wallis, 1766; Cook, 1768, 1772, 1776; continued by King, 1780; and since by Portlocke, 1788; Bougainville, 1766; La Peyrouse, 1782; D'Entrecasteux, 1791.
- Circumnavigators of the United States, the first ship with which this was performed, returned to Boston, in December, 1790.
- Coals discovered near New-Castle, 1234; first dug at New-Castle, by a charter granted the town, by Henry III.; first used, 1280; dyers, brewers, &c. in the reign of Edward I. began to use sea-coal for fire, in 1350.
- Coal, in the United States, is found in great abundance on both sides of the Appalachian mountains. A coal-mine near Pittsburg, took fire, and burned many years; the fire was finally extinguished by the incumbent earth and rocks falling into the cavity.
- Coffee, first brought into England by Nathaniel Conopius, a Cretan, who made it his common beverage, at Baliol College, Oxford, in 1641; first brought to Marseilles, 1644.
- Coffee-trees were conveyed from Mocha to Holland, in 1616; and carried to the West-Indies in the year 1726; first cultivated at Surinam by the Dutch, 1718; its culture encouraged in the plantations, 1732.
- Coin—silver, coined at Rome, 269 before Christ; before then brass money was only used; coin first used in Britain, 25 years before Christ.
- The Mint of the United States of America, established 1793, issued gold and silver coin; the copper had been delivered before. The gold coins are eagles, half eagles, and quarter eagles. The first is exactly five and forty shillings, English money, or ten dollars, American coin. The dollars are coined in the same divisions of half and quarter dollars, which makes the course of exchange simple; as ten quarter dollars make the quarter eagle, ten half dollars the half eagle, and ten dollars the eagle. There is, besides, one more silver coin, which is called a dime, and is the tenth part of a dollar. The copper coin is called a cent, and is the tenth part of a dime.
- Colossus of Rhodes, a gigantic brazen statue set up at Rhodes, about a. d. 300; thrown by an earthquake, 234; lay on the ground nearly 900 years, and was finally sold by the Saracens when they took the island of Rhodes, A. D. 672. The metal was supposed to have weighed 720,000 lbs.
- Compass, or the polarity of magnetised iron, one of the greatest, and as to the date of its discovery, most uncertain of human improvements. There is, however, good evidence to prove that the mariner's compass was in use in Europe as early as A. D. 1180; variation first observed by Columbus and his companions, 1492; its dip, about 1576.
- Copper, first imported from Virginia, October, 1730. Copper money first coined in Scotland by order of parliament, 1466; in Ireland, 1399; in France, 1580; in England, the first legal, 1689. Tradesmen's tokens, or half pence, were coined in 1672; penny pieces first issued July 26, 1797; half pence on the same principle, issued January, 1800.
- Copper is found native in the United States, near the south side of Lake Superior, and in some other places.
- Cow-pox, inoculation by, as a security against the small-pox, introduced into England, by Dr. Jenner, 1800.
- Croisade, or crusade, expeditions undertaken from Europe with the avowed intention to recover the Holy Land from the Mahometans. The first was undertaken from France, 1096. The second was undertaken in 1147; the third in 1188; the fourth in 1203; the fifth in 1227; the sixth in 1248, and seventh in 1270.
- Cronstadt, city of Russia, at the mouth of the Neva, built by Peter the Great, 1704.
- Cuba was discovered by Columbus in 1492; taken possession of by the Spaniards, 1511; invaded by the British, 1762, and Havana taken; given up to Spain 1763.
- Custom-house, London, first built, 1559; burnt down 1814; rebuilt, and opened for business, 1817.
- Cypher, or the Arabic numerical figures, introduced into Europe by the Moors of Spain, in 813.
- Dartmoor, England, depot at for prisoners, at which, April 8th, 1815, seven American prisoners were massacred and thirty wounded.
- Davis's Straits, discovered 1585.
- Delft earthenware first made at Faenza 1450.
- Diamonds first polished and cut at Bruges, 1489.
- Diamond mines discovered in Brazil, 1730; that at Coulour in the East-Indies, 1640; that at Golconda, in 1584; one sent from Brazil for the court of Portugal, weighed 1680 carats, or twelve ounces and a half, valued at 224 millions sterling. Governor Pitt's weighed 127 carats, and 106 after cutting, and sold for 135,000*l.* to the king of France. That which belonged to Aureng Zebe weighed 793 carats. The Mogul's weighed 279 carats, worth 779,244*l.* The grand duke of Tuscany's weighed 139 carats.
- Dieu et mon droit, first used as a motto by Richard I. on a victory over the French, 1194.
- Distaff spinning first introduced into England by Bonavera, an Italian, 1505.
- Distilling first practised in Spain by the Moors, 1150. Distillation of spirituous liquors began in the 12th century. In Ireland in 1590.
- Docks, London, the first stone of, laid June 26, 1802; opened January 30, 1805.
- Earthen vessels first made by the Romans 715 before Christ; the first made in Italy 1710; the present improved kind began in 1763, by Mr. Wedgwood.
- Eddystone light-house, near Plymouth, England, first built, 1696; blown down, November 26, 1703; rebuilt, 1706; burnt down, December, 1755; rebuilt



- October, 1759; again burnt down, 1770; rebuilt 1774.
- Electricity, first idea of, given by two globes of brimstone, 1467; electric spark discovered at Leyden, 1746; first known it would fire spirits, 1756; that of the aurora borealis and of lightning in 1769.
- Engraving on metal plates, first known in Europe a. C. 504, by a map on brass brought from Qonia by Anaxagoras of Samos; and yet it was not until A. D. 1423, that impressions were taken on paper from engraved plates; the art of taking impressions from engravings on copper as now used, 1511; in mezzotint, and improved by prince Rupert, of Palatine, 1648; to represent wash, invented by Barable, a Frenchman, 1761; crayon engraving invented at Paris by Bonnet, 1769.
- Engraving on wood invented in Flanders, 1423; revived by Alb. Durer, 1511; on glass invented 1799, at Paris, by Boudier.
- Etching on copper invented with aqua fortis, 1512.
- Excise, the first used in England, 1643.
- Fairs and markets first instituted in England by Alfred, about 886. The first fairs took their rise from wakes; when the number of people then assembled brought together a variety of traders annually on these days. From these holidays they were called *feria*, or fair.
- Falmouth, seaport of Massachusetts, taken and burnt by the British, October 18th, 1775.
- Fish, the increase of, is said to be in the following proportion:—a flounder of two ounces contains 133,407 eggs or spawn; herrings weighing from four ounces to five and three-fourths, from 21,285 to 36,960; lobsters, from fourteen to thirty-six ounces, contain 21,699; mackerel, twenty ounces, 454,061; shrimps, from 2,849 to 6,897; smelts, from 14,411 to 38,278; soal of five ounces, 38,772; one of fourteen ounces and a half contains 100,362; to which may be added the cod, which produces 3,686,706.
- Florida, discovered by Ponce de Leon, a Spaniard, in 1512.
- Formosa, in the Chinese seas, shook off the Chinese yoke, and massacred 10,000 Chinese, driving the remainder into the woods and rocks of the island, 1788.
- Fruits of foreign countries first brought into Italy, 70 before Christ, and flowers, sundry sorts before unknown, were brought into England in the reigns of Henry VII. and VIII. from about 1500 to 1578. Among others of less note, the musk and damask roses, of great use in medicine, and tulips. Several sorts of plum-trees and currant-plants; also saffron, woad, and other drugs for dying, attempted to be cultivated, but without success.
- Gardening introduced into England from the Netherlands, from whence vegetables were imported, till 1509; the pale gooseberry, with salads, garden roots, cabbages, &c. brought from Flanders, and hops from Artois, 1520.
- Rye and wheat, from Tartary and Siberia, where they are yet indigenous; barley and oats unknown, but certainly not indigenous in England; rice from Ethiopia; buckwheat, Asia; borage, Syria; cress-es, Crete; canilflower, Cyprus; asparagus, Asia; chervil, Italy; fennel, Canary Islands; anise and parsley, Egypt; garlic, the East; shallots, Siberia; horseradish, China; kidney-beans, East Indies; gourds, Astracan; lentils, France; potatoes, Brazil; tobacco, America; cabbage, lettuce, &c., Holland.
- Jassamine comes from the East Indies; the elder tree, from Persia; the tulip, from Cappadocia; the daffodil, from Italy; the lily, from Syria; the tuberoses, from Java and Ceylon; the carnation and pink, from Italy, &c.; ranunculus, from the Alps; apples, from Syria; apricots, from Epirus; artichokes, from Holland; celery, from Flanders; cherries, from Pontus; currants, from Zant; damask and musk roses, from Damascus, as well as plums; hops, from Artois and France; gooseberries, from Flanders; gilliflowers, carnations, the Provence rose, &c. from Thoulouse, in France; oranges and lemons from Spain; beans and peas from Spain.
- Gas, use of, introduced in London, for lighting shops and streets, 1814; first into the United States, at Baltimore, 1821.
- Gazettes, of Venetian origin, and so called from the price being gazetta, a small piece of money; the first published in England, was at Oxford, November 7, 1665.
- Georgium Sidus discovered by Herschel, 1781.
- Gibraltar was taken from the Moors by the Castilians in 1463; taken by Sir George Rooke, July 23, 1704; besieged by the Spaniards, September 13, 1782, when their floating batteries were burnt by red-hot balls from the garrison, commanded by Gen. Elliott.
- Gilding with leaf gold on bole ammoniac, art of, invented by Margaritone, 1273; on wood, 1680.
- Gipsies quitted Egypt when attacked by the Turks in 1515, and wandered over almost all Europe.
- Glass, the art of making it, known to the Romans at least before 79; known to the Chinese about 200; introduced into England by Benedict, a monk, 674; glass windows began to be used in private houses in England, 1180; glass first made in England into bottles and vessels, 1557; the first plate glass for looking glasses and coach-windows, made at Lambeth, 1673; in Lancashire, 1773; window glass first made in England, 1557.
- Grapes brought to England and planted first at Blaxhall, in Suffolk, 1552; cultivated in Flanders, 1276.
- Guinea coast discovered by the Portuguese, 1482; slave trade commenced here by Capt. Hawkins, an Englishman, 1563. He was assisted with a subscription by sundry of his countrymen—sailed from England with three ships, purchased negroes, sold them at Hispaniola, and returned home, richly laden with hides, sugar, and ginger.
- Guineas were first coined, 1673, from gold brought from the coast of Guinea.
- Gunpowder invented, 1330; first made in England, 1418; first used in Spain, 1344.

- Guns, great, invented, 1330; used by the Moors at the siege of Algeiras, in Spain, in 1344; used at the battle of Cressy, in 1346; when Edward had four pieces of cannon, which gained him the battle; they were used at the siege of Calais, in 1347; in Denmark, 1354; at sea by Venice against Genoa, 1377; first used in Spain, 1406; first made in England of brass, 1635; of iron, 1547; invented to shoot whales, 1731; first used in England, at the siege of Berwick, 1405; bombs and mortars invented, 1634.
- Hackney coaches first used, twenty in number, in London, 1625.
- Handkerchiefs first manufactured at Paisley, in Scotland, 1748, when 15,886*l.* worth were made: in 1784 the manufacture yielded above 164,385*l.*
- Hats invented at Paris, 1404: first made in London, 1510.
- Hemp and flax first planted in England, 1533. There are 180,000*lb.* of rough hemp used in the cordage and sails of a first-rate man of war.
- Herring fishery, first practised by the Hollanders, 1164: herring pickling first invented, 1397.
- Hour Glasses were invented in Alexandria, 240, and introduced at Rome, 158 years before Christ.
- Hudson's Bay discovered by Capt. Hudson, 1607.
- Indigo, first produced in Carolina, 1747: cultivated in the open air at Vaulcluse, in France, 1508.
- Insurance on shipping began in England, 1660.
- Insurance offices established in London, and its vicinity, 1696.
- Insurance policies were first used in Florence in 1523: first society established at Hanover, 1530: that at Paris, 1740.
- Interest first mentioned as legal, 1199, at 10 per cent.: in 1300, at 20 per cent.: in 1558, at 12 per cent.: in 1571, at 10 per cent.: in 1625, at 8 per cent.: in 1749, the funds were reduced from 4 to 3 1-2 and 3 per cent.
- Iron discovered by the burning of mount Ida, 1406 before Christ: first cast in England at Backstead, Sussex, 1544: first discovered in America, in Virginia, 1715: bullets first used in England, 1550.
- Italian method of book-keeping, published in England, 1569.
- Jamaica discovered by Columbus, 1494: settled by the Spaniards, 1509: plundered, 1595: pillaged by the English, 1635: taken by the English, May 7, 1655.
- Jamestown, first capital of Virginia, founded 1607.
- Japan discovered, 1542: visited by the English, 1612.
- Jenite, a new mineral discovered in the island of Elba, 1808.
- Kamtschatka discovered by the Russians, 1739.
- Knitting stockings invented in Spain, about 1550.
- Knives first made in England, 1563.
- Lace, Flanders, more valuable than gold—one ounce of fine Flanders thread has been sold in London, for 4*l.* Such an ounce made into lace may be sold for 40*l.*, which is ten times the price of standard gold, weight for weight.
- Lamp for preventing explosions by fire-damp in coal mines, invented by Sir Humphrey Davy, 1815.
- Lanterns invented by king Alfred, 890.
- Lawns and thread gauze were in 1784, manufactured at Paisley to the value of 164,385*l.* 16*s.* 6*sd.*
- Leaden pipes for conveying water invented, 1236.
- Letters invented by Memnon, the Egyptian, 1822 before Christ.
- Linen first made in England, 1253: the luxurious wore linen, but the generality woollen shirts. Table linen very scarce in England, 1886.
- Lithographic printing, art of, first brought into England, 1801.
- Loadstone, polar attraction of, known in France before 1180.
- Log-line in navigation used, 1570.
- Logwood first cut in the bay of Honduras and Campechy by the English, 1662.
- Looking-glasses made only at Venice, 1300.
- Looms, the power-loom invented by the Rev. Mr. Cartwright, a clergyman of Kent, in England, 1787.
- Lotteries, the first mentioned by historians for sums of money, 1630: established 1693.
- Madagascar discovered by the Portuguese, 1500.
- Madeira, island of, discovered 1344 and 1418.
- Magellan, straits of, discovered 1520.
- Magnifying glasses invented by Roger Bacon, 1260.
- Malt liquor used in Egypt 450 before Christ.
- Mercator's charts invented 1556.
- Microscopes first used, 1621: the double ones, 1624: solar microscopes invented, 1740.
- Money, first mentioned as a medium of commerce in the 23d chapter of Genesis, when Abraham purchased a field as a sepulchre for Sarah, in the year of the world, 2139: first made at Argos, 894 before Christ: has increased eighteen times its value from 1290 to 1640: and twelve times its value from 1530 to 1800.
- Mortars for bombs first made in England, 1543.
- Moscow founded 1156: entered by the French, September 14, 1812: set on fire in 500 different places at once, by order of the Russian governor, and three fourths of the city destroyed two days after: evacuated by the French, and re-entered by the Russians, October 22, 1812.
- Mulberry trees first planted in England, 1609: in the English provinces of North America, about 1750, for cultivating silk.
- Musical notes as now used, 1330.
- Muskets first used in France at the siege of Arras, 1414: in general use, 1521.
- Muslims from India, first in England, 1670: first manufactured there, 1781.
- Needles were first made in England by a native of India, 1545, the art lost at his death: recovered by Christopher Greening, in 1560, who was settled with his three children, Elizabeth, Johr, and Thomas, by Mr. Damer, ancestor of the present earl of Dorchester, at Long Gredon, in Bucks, where the manufactory has been carried on from that time to this present day.



- New style first introduced into Europe, 1582: into Holland and the protestant states, 1700: in England, 1752.
- Newspaper, first published in England, titled the English Mercury, July 28, 1558. The present number in the United States amounts to more than a thousand
- North east passage to Russia discovered, 1553.
- Notes and bills first stamped, 1782.
- Nova Zembla discovered, 1553.
- Organs brought to Europe from the Greek empire, were first invented and applied to religious devotion in churches, 758.
- Otaheite, or George III.'s island, discovered June 18, 1765.
- Owhy-he island discovered 1778, where Capt. Cooke was killed.
- Oxford university, founded by Alfred, 886.
- Paper currency established in America, May 15, 1775.
- Paper money first used in America, 1740.
- Paper made of cotton was in use in 1000: that of linen rags, in 1319: the manufacture of, introduced into England at Dartford, in Kent, 1588: scarcely any but brown paper made in England, till 1690: white paper first made in England, in 1690.
- Parchment invented by king Attalus, 587.
- Patent granted for titles, first used, 1344: first granted for the exclusive privilege of publishing books, 1591.
- Pearl-shes manufactory first set up in Ireland, 1783.
- Pearls, artificial, were invented, 1686.
- Pendulums for clocks invented, 1656.
- Pens for writing were first made from quills in 635.
- Peru conquered by Pizarro, 1533.
- Pistols first used by the cavalry, 1544.
- Pitch and tar made from pit-coal, discovered at Bristol, 1779.
- Plaster of Paris, the way first found out for taking a likeness in, 1470.
- Plate-glass manufactory established at Lancashire, in 1773: first in France, 1688.
- Policy of insurance in writing first used at Florence, 1569.
- Potatoes first brought to England from America, by Hawkins, in 1563: introduced into Ireland by Sir Walter Raleigh, in 1586, and were not known in Flanders till 1650.
- Pottery, great discoveries made in it by Mr. Wedgewood, 1763.
- Printing invented by J. Faust, 1441: first made public by John Gottenburgh, of Mentz, 1458: wooden types first used, 1470: brought into England by William Caxton, 1471, who had a press in Westminster Abbey till 1494: first patent granted for it, 1591: first introduced into Scotland, 1509: first used at Lyons, 1488: first set up at Constantinople, in 1784: printing in colors invented, 1626.
- Pumps invented, 1425.
- Quicksilver, use of, discovered in refining silver ore, 1540.
- Rail Roads, first used near Newcastle upon Tyne, about 1650.
- Rice was cultivated in Ireland in 1585: in England, 1600: had its first cultivation in South Carolina, by chance, 1702.
- Rum imported into England in 1789, was 3,300,000 gallons: in 1796 there were imported 4,196,198 gallons.
- Sail-cloth first made in England, 1590: cotton sail-cloth made at Baltimore and at Patterson, N. J. and brought into use in the United States, 1824.
- Saint Helena first possessed by the English, 1600.
- Saint Lawrence river discovered and explored by the French, 1508.
- Salem, in New England, settled, 1628.
- Salt mines in Staffordshire discovered, 1670: rock salt was discovered about 950: in Poland, in 1289.
- Saltpetre first made in England, 1625.
- Savannah, in Georgia, settled 1732.
- Sextant invented by Tycho Brahe, in 1550.
- Sheep, the number in England is from 20 to 25 millions. The value of their wool, 3,200,000*l*.
- Ship.—The first seen in Greece arrived at Rhodes from Egypt, 1485 before Christ; the first double-decked one built in England was of 1000 tons burden, by order of Henry VII. 1509; it was called the Great Harry, and cost 14,000*l*.; before this, twenty-four gun ships were the largest in the navy, and these had no port-holes, the guns being on the upper decks only. Port-holes and other improvements were invented by Decharges, a French builder at Brest, in the reign of Louis XII., 1500; there were not above four merchant ships of 120 tons burden, before 1551.
- Ship-building, the art of, attributed to the Egyptians, as the first inventors, the first ship being brought from Egypt to Greece by Danaus, 1485 B. C. The first ship of the burden of 800 tons was built in England in 1597.
- Shoeing of horses first introduced, 481.
- Shoes of the present fashion first worn in England, 1633.
- Signals at sea first devised by James II. 1665.
- Silk, wrought, brought from Persia to Greece, 325 B. C.
- Soap first made at London and Bristol, 1524
- Speaking trumpets invented by Kircher, a Jesuit, 1652.
- Spectacles invented by Spina, a monk of Pisa, 1299.
- Steam applied to the purpose of inland navigation in America, 1810.
- Steel may be made three hundred times dearer than standard gold, weight for weight; six steel wire springs for watch pendulums weigh one grain, to the artists, 7*s*. 6*d*. each, equal to 2*l*. 5*s*.; one grain of gold only 2*d*.
- Stereotype printing invented by William Ged, a goldsmith, of Edinburgh, 1725.
- Stops in Literature, introduced 1520; the colon 1580; semicolon 1599.
- Stucco work revived by D'Udine, about 1500

Sugar first mentioned by Paul Eginetta, a physician, 625; produced in Sicily, 1148; first produced in Madeira, 1419; in the Canary Islands, 1503; carried to the West-Indies, by the Portuguese and Spaniards, 1510; cultivated at Barbadoes, 1641; sugar refining first discovered by a Venetian, 1503; practised first in England, in 1569.

Tanning leather, a new and expeditious method invented, 1795.

Tea first brought into Europe by the Dutch East India Company, early in 1591.

Tea destroyed at Boston by the inhabitants, 1773.

Telegraphs invented, 1687; put into practice by the French, in 1794; by the English, Jan. 28, 1796.

Telescopes invented by Z. Jansen, a spectacle maker at Middleburgh, 1590; the first reflecting one made on the principles of Sir Isaac Newton, 1692.

Thermometers first invented by Drebel, a Dutchman, 1620; improved by Reaumur, 1730, and by Fahrenheit, 1749.

Thread first made at Paisley, in Scotland, in 1722.

Ticonderoga taken by the English, 1759; by the Provincials, May 13, 1775.

Tides, the first theory of, by Kepler, 1596.

Tiles first used in England, 1246.

Time first computed from the Christian era, 516; in history, 784; in Spain, 1258; in Arragon and Castile, 1333; in Portugal, 1415.

Time-measure barometer introduced by Scipio Nasica, 159; king Alfred's time-keeper was six large wax tapers, each twelve inches long; as they burnt unequally, owing to the wind, he invented a lantern made of wood and thin-scraped plates of ox-horns, glass being a great rarity, 887. The ancients had three sorts of time measures, hour-glasses, sun-dials, and a vessel full of water with a hole in its bottom.

Tin found in Germany, 1241; in no place before but in Devonshire and Cornwall, in Barbary, 1640; in India, 1740; in New Spain, 1782.

Toad, a live one found in a block of stone, at Newark, April 15, 1806; another found alive, in the heart of an oak tree, about thirty inches in diameter, at Rainford, Lancashire, January, 1810.

Tobacco first discovered in St. Domingo, in 1496; afterwards by the Spaniards in Yutacan, 1520; first brought into England, 1583; allowed to be cultivated in Ireland, 1779.

Torture abolished in Sweden, by order of the king, 1786; in Poland, 1776; abolished in France by edict, August 25, 1780; abolished in Spain, August, 1814.

Tournaments began in 170; instituted by Henry, emperor of Germany, 919.

Tragedy, the first acted at Athens, on a wagon, by Thespis, 585 before Christ.

Trajan's pillar erected in Rome, 114.

Trinidad, the isle of, discovered, 1498; taken by the English, with four ships of the line, 1797.

Tripoli reduced by admiral Blake, 1655; attacked four times by the United States squadron, under commodore Preble, in the year 1804.

Troy built, 1480; the kingdom of, began 1446 before Christ; destruction of, June 11, 1184 before Christ.

Trumpets first sounded before the kings of England, by order of Offa, king of Mercia, 790.

Tulips first brought into England, 1578.

Tunis reduced by admiral Blake, 1665; taken by the emperor Charles V. and restored to its king that had been banished, 1535.

Tunnel of the Tavistock canal, a mile and a half in length, and in some parts of it, more than four hundred feet below the surface, completely holed, after thirteen years' labor, August 24, 1816.

Turkeys came into England, 1523.

Turnpikes first legally erected in England, 1663, yielded in 1783, about 508,000*l*.

Types of wood for printing used, 1470.

Union of the crowns of England and Scotland, 1603; of the two kingdoms attempted, 1604, but failed; again ditto, 1670; carried into effect, May 1, 1707, and thence the island is called Great-Britain; union of Britain and Ireland took place, Jan. 1, 1801.

United States.—Summary statement of the value of the Exports of the Growth, Produce, and Manufactures of the United States, during the year commencing on the 1st day of October, 1831, and ending on the 30th day of September, 1832.

#### THE SEA.

##### Fisheries—

Dried fish or cod fisheries	\$749,909
Pickled fish, or river fisheries, herring, shad, salmon, mackerel	306,812
Whale and other fish oil	1,009,728
Spermaceti oil	38,161
Whalebone	186,595
Spermaceti candles	267,332
	<hr/> \$2,558,538

#### THE FOREST.

Skins and furs	691,909
Ginseng	99,545

##### Product of wood—

Staves, shingles, boards and hewn timber	\$1,522,053
Other timber	188,608
Masts and spars	73,368
Oak bark & other dye	52,944
All manufactures of wood	312,678
Naval stores, tar, pitch, rosin, & turpentine	476,291
Ashes, pot and pearl	930,398
	<hr/> —3,556,340
	4,347,794

#### AGRICULTURE.

##### Product of animals—

Beef, tallow, hides, horned cattle	774,087
Butter and cheese	290,820
Pork, pickled bacon, lard, live hogs	1,928,196
Horses and mules	164,034



Sheep	22,385	
Vegetable food—	3,179,522	
Wheat	93,500	
Flour	4,880,623	
Indian corn	278,740	
Indian meal	480,035	
Rye meal	75,392	
Rye, oats, and other small grain and pulse	78,447	
Biscuit or ship bread	255,735	
Potatoes	42,077	
Apples	15,314	
Rice	2,152,631	
	8,352,494	
	11,532,016	
Tobacco	5,999,759	
Cotton	31,724,682	
All other agricultural products—		
Flaxseed	123,036	
Hops	25,448	
Brown Sugar	11,232	
	159,716	

## MANUFACTURES.

Soap and tallow candles	701,184	
Leather, boots and shoes	277,398	
Household furniture	169,039	
Coaches and other carriages	45,277	
Hats	310,912	
Saddlery	29,572	
Wax	62,444	
Spirits from grain, beer, ale and porter	127,583	
Snuff and tobacco	295,771	
Lead	5,483	
Linseed oil and spirits of turpentine	33,304	
Cordage	13,863	
Iron, pig, bar, and nails	65,979	
castings	26,629	
manufactures of	120,222	
Spirits from molasses	38,221	
Sugar, refined	74,673	
Chocolate	2,255	
Gunpowder	96,023	
Copper and brass	105,774	
Medicinal drugs	130,238	
Cotton piece goods	2,730,833	
Printed or colored	104,870	
White	1,052,891	
Nankeens	341	
Twist yarn and thread	12,618	
All manufactures of	58,854	
Flax and hemp—	1,229,574	
Cloth and thread	1,570	
Bags and all manufactures of	2,635	
Wearing apparel	80,803	
Combs and buttons	124,305	
Brushes	4,754	
Billiard tables	1,310	
Umbrellas and parasols	20,361	

Leather and morocco skins not sold per pound	42,565	
Printing presses and type	22,553	
Musical instruments	4,952	
Books and maps	29,892	
Paper and other stationary	64,847	
Paints and varnish	24,611	
Vinegar	4,677	
Earthen and stone ware	6,833	
Fire engines and apparatus	7,758	
Manufactures of glass	106,855	
tin	3,167	
pewter and lead	983	
marble and stone	3,454	
gold and silver and gold leaf	653	
Gold and silver coin	1,410,941	
Artificial flowers and jewelry	14,852	
Molasses	2,493	
Trunks	5,314	
Brick and lime	3,502	
Domestic salt	27,914	
Articles not enumerated—	3,251,774	
Manufactured	477,267	
Other	358,181	
	830,448	
	\$63,137,470	

Vines planted in Germany and North Gaul, 276.

Viols invented about 1477; and introduced by Charles II.

Watches invented at Nuremberg, in Germany, 1477; first used in astronomical observations, 1500.—The emperor Charles V. was the first who had any thing that might be called a watch, though some call it a small table clock, 1530; watches first brought to England from Germany, 1577; spring pocket ones invented by Hooke, 1658

Water-mills for grinding corn were invented by Belisarius, while besieged in Rome by the Goths, 555. The ancients parched their corn, and pounded it in mortars; afterwards mills were invented, which were turned by men and beasts with great labor; and yet Pliny mentions wheels turned by water.

Weights and measures invented, 869 before Christ; fixed to a standard in England, 1257; regulated, 1492.

Whale fishery, the first by the Dutch, 1596; by the English at Spitsbergen, 1598.

Whalebone found by the English ships at Cape Breton, 1521; first mentioned brought home with oil, 1617.

Whales killed at Newfoundland and Iceland for their oil only, 1578; the use of their bones and fins not then known, consequently no stays worn by ladies.

Woollen-cloth, manufactures of, in all civilized countries, and in very remote ages, and probably of linen also.

York, Upper Canada, capitulated to the Americans, April 27, 1813.

Zodiac, signs of the, invented by Anaximander, 547 B C

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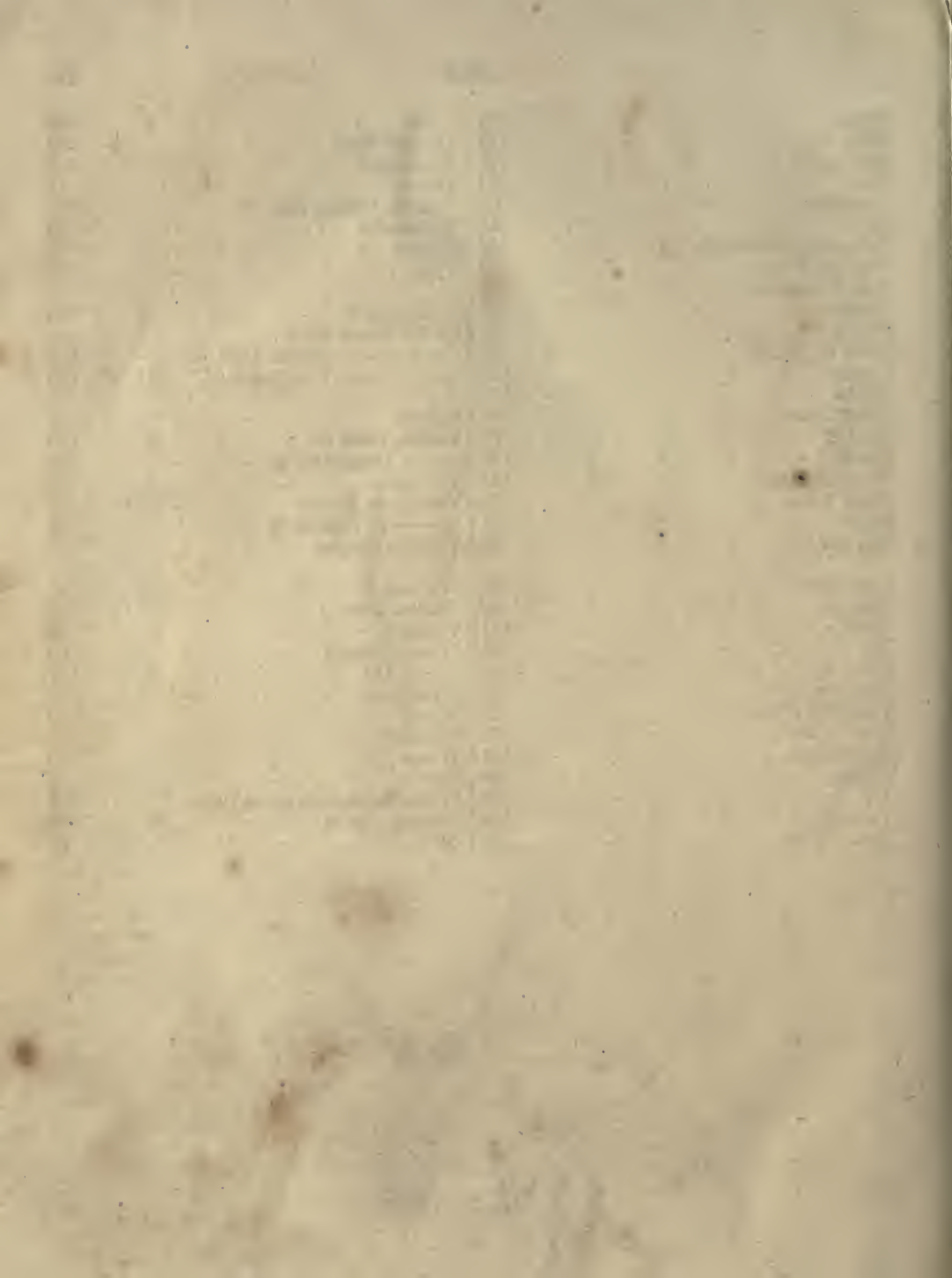
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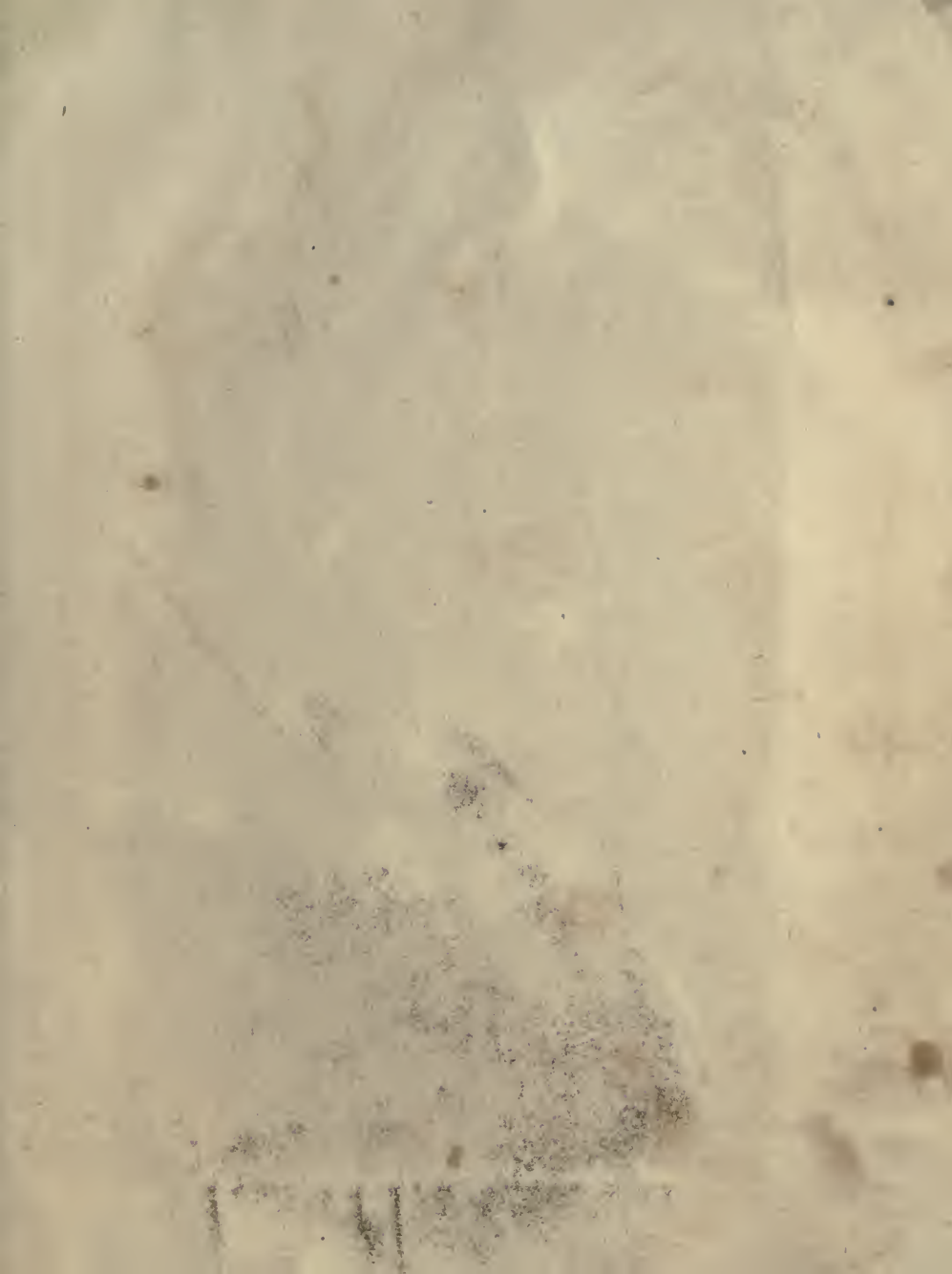


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